

ICP Test Report Certification Packet

Company name:	Littelfuse, Inc.	
Product Series:	3AB Fuse	
Product #:	314xxxP Series	
Issue Date:	November 12, 2013	}
2011/65/EU)-restricted packing/packaging ma In addition, it is hereby for unit parts, the packi	substance nor such us terials, and for additives a reported to you that the p	ere is neither RoHS (EU Directive 2002/95/EC/se, for materials to be used for unit parts, for and the like in the manufacturing processes. parts and sub-materials, the materials to be used and the additives and the like in the manufacturing mponents.
	Issued by:	JORDANUFF H. CABILAN [Global EHS Engineer]
(1) Parts, sub-materia This document of Littelfuse, Inc.	•	HS-Compliant series products manufactured by
< Raw Materials Please see 3		
()	all measurable substance appropriate pages as ider	
Remarks :		



Table 1: List of Raw Materials covered by this report

Total Parts	Raw Material Part Number	Raw Material Description	Page(s)
1	910-282/ 910-005	Cap	3-6
2	C610 (909-162, 909-165, 909-532)	Ceramic Tube - Body	7-35
3	(3M-3779-PG) 087244	HMA	36-48
4	10-1185 (497xxx-001)	Element - Ni42Fe58MCuMSn	49-53
5	4-1357 (497xxx)	Ni 99.9	54-58
6	082xxx	Element - Ag Plated Cu	59-63
7	082xxx-001	Element - 99% Cu Sn Plated	64-71
8	YTW206 (692529)	Solder	72-76
9	AIM230 Fastcore H RSA605 (692539-003)	Solder	77-80
10	090187	Filler	81-87
11	090184	Filler	88-95
12	425901	Ink-Red	96-106
13	425902	Ink-Black	107-117
14	425904	Ink-Blue	118-128
15	425900	Ink-orange	129-139
16	425903	Ink-yellow	140-150
17	425907	Ink -green	151-161
18	425911	Ink-violet	162-172
19	934-006/934-057/ 934-058/934-061	Overcap (Fuse Copper Shell) (Base & Plating)	173-176
20	091254	Mineral Sand	177-183
21	YTW108 (692535-003)	Solder	184-189
22	EP608 (087355)	Glue (RoHS & Halogens)	190-200
23	LF079020 (079xxx, 917-445xxxxx-P/	Cu/C (102) Cu 110 Strip	201-204
	917-480xxxx-P)	Cu(CA102) Cu110 Strip Element – Zinc Alloy	
24	917-481xxxx-P	Element – Zinc Alloy	205-208



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Customer: SuZhou FuHong Electronic Industrial Co., Ltd.

Address: NO. 89 WEI DU ROAD, WANGTING TOWN, XIANGCHENG DISTRICT, SUZHOU, CHINA

Report on the submitted sample said to be

Sample name: Copper shell

Model: /

Item/Lot No.: /

Material: /
Buyer: /
Supplier: /

Manufacturer: /

Sample received date: Apr.03, 2013

Testing period: From Apr.03, 2013 to Apr.08, 2013

Testing Requested

As specified by client, to determine the Lead, Cadmium, Mercury & Hexavalent Chromium content in the submitted sample in accordance with Directive 2011/65/EU (RoHS).

Testing method:

Testing Item	Pretreatment method	Measuring instrument	MQL
Lead (Pb)	IEC 62321: 2008, section 9	ICP-OES	2mg/kg
Cadmium (Cd)	IEC 62321: 2008, section 9	ICP-OES	2 mg/kg
Mercury (Hg)	IEC 62321: 2008, section 7	ICP-OES	2 mg/kg
Chromium (Cr VI)	IEC 62321: 2008, Annex B	UV-VIS	0.02mg/kg*

Note:

Conclusion:

When tested as specified, the submitted sample complied with the requirements of Directive 2011/65/EU (RoHS).

******FOR FURTHER DETAILS, PLEASE REFER TO THE FOLLOWING PAGE(S)******

Signed for and on behalf of Shenzhen AOV Testing Technology Co., Ltd, Kunshan Branch

Project Leader:

Li Tingting, Maggie

Chemical Test Director

Reviewed by: Weikin

Wang Wexin, Weikin

Technical Director

Approved by

Yuan Qi, Mickey

Lab Manager

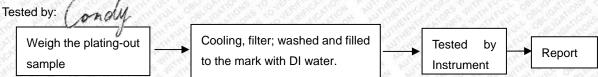


^{-* 0.02} mg/kg refers to the MQL of sample extraction liquid.



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Test Flow: 1. To Determine Lead, Cadmium Content: (Metal substrate) Tested by: onoul Add the digestion solution; the Weigh the sample into Add H₂O₂ until the sample is clear vessel is heated until the sample a vessel. has been dissolved Cooling the vessel, filter; washed and Tested by ICP-OES Report filled to the mark with distilled water. 2. To Determine Mercury Content: (Metal substrate) Tested by: onoul The sample is digested in the Weigh the sample Add the digestion solution, close microwave oven following a specific into a vessel. the microwave vessel. decomposition program. Cooling the vessel, filter; washed and Tested by ICP-OES Report filled to the mark with distilled water. 3. To Determine Hexavalent Chromium Content (boiling- water- extraction): (Metal substrate) Tested by: Remove the sample, and cool Take the (50±5) cm² Heat 50 mL of DI water in the the beaker to room temperature, sample in the beaker. beaker to boiling for 10 min and do the color reaction Test the sample solution and the 0.02 Report mg/kg standard solution by UV-VIS. 4. To Determine Lead, Cadmium and Mercury Content: (Plating)

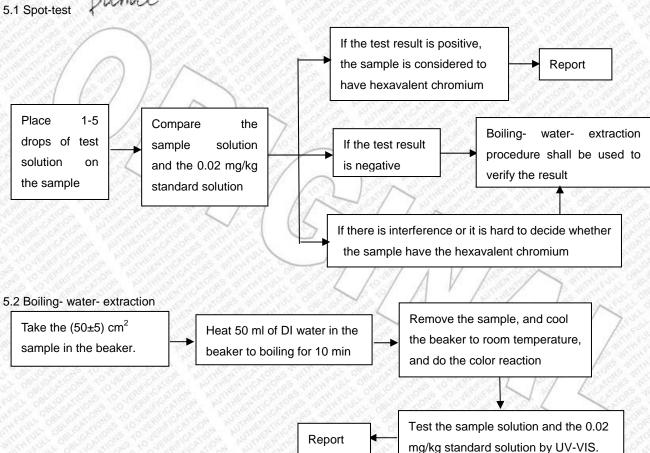






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5. To Determine Hexavalent Chromium Content in colorless and colored chromate coating on metals: (Plating) Tested by:



Sample Description:

Code	Sample Description
1-1	Substrate
1-2	Plating

Item	Unit	RoHS Limit	Results		
		OBLIGHTIONS TO	1-1	1-2**	
Lead (Pb)	mg/kg	1000	12.0	N.D.	
Cadmium (Cd)	mg/kg	100	2.1	N.D.	
Mercury (Hg)	mg/kg	1000	N.D.	N.D.	
Chromium (CrVI)	mg/kg	1000	Negative	Negative	





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Note:

- -Specimens, which requested to determine Lead, Cadmium and Mercury Content, have been dissolved completely.
- -N.D.=not detected(<MQL)
- -MQL=Method Quantitation Limit
- -Negative=Absence of Cr (VI);
- -Positive=Presence of Cr (VI);

Uncertain= can not verify whether the sample have Hexavalent Chromium by spot-test.

- (The tested sample should be further verified by boiling-water-extraction method if the spot test result is uncertain or negative.)
- -**The test is based on the following assumption: The sample plating is a single layer and each part is uniform. The test result maybe cannot stand for the physical truth of sample plating.
- -Photo is included

Photograph of Sample



Copper shell

End of Report





Signature yalid For Question Please Contact with SGS www.tw.sgs.com

Test Report

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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF

The following sample(s) was/were submitted and identified by/on behalf of the client as:

Sample Description

: CERAMIC

Style/Item No.

C610

Sample Receiving Date

: 2013/1/14

Testing Period

: 2013/1/14 TO 2013/01/21

Test Result(s)

: Please refer to next page(s).

Conclusion

: Based on the performed tests on submitted samples, the test results of Cadmium, Lead, Mercury, Hexavalent Chromium Cr(VI), PBBs and PBDEs comply with the limits as set by

RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Chenyu Kung / Signed for and on be SGS TAIWAN LTD. Chemical Laboratory - Taipei



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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



Test Result(s)

PART NAME No.1 : CREAM CERAMIC

Test Item(s)	Unit	Method	MDL	Result No.1	Limit
Cadmium (Cd)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.	100
Lead (Pb)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	204	1000
Mercury (Hg)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.	1000
Hexavalent Chromium Cr(VI)	mg/kg	With reference to IEC 62321: 2008 and performed by UV-VIS.	2	n.d.	1000
BBP (Benzyl butyl phthalate) (CAS No.: 85-68-7)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.	1
DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.	-
DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.01	n.d.	1
DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.01	n.d.	
DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.	17
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.	
Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.	-
PFOA (CAS No.: 335-67-1)	mg/kg	With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.	A
Polychlorinated Biphenyls (PCBs) (CAS No.: 1336-36-3)	mg/kg	With reference to US EPA 3540C method. Analysis was performed by GC/MS.	0.5	n.d.	

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Test Item(s)	Unit	Method	MDL	Result No.1	Limit
Polychlorinated Terphenyls (PCTs)	mg/kg	With reference to US EPA 3540C method. Analysis was performed by GC/MS.	0.5	n.d.	
Polychlorinated Naphthalene (PCNs)	mg/kg	With reference to US EPA 3540C method. Analysis was performed by GC/MS.	5	n.d.	91
Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins) (CAS No.: 85535-84-8)	mg/kg	With reference to US EPA 3540C method. Analysis was performed by GC/MS.	100	n.d.	
PVC	**	Analysis was performed by FTIR and FLAME Test.	-	Negative	1.2
Formaldehyde (CAS No.: 50-00-0)	mg/kg	With reference to ISO 17226-1(2008). Analysis was performed by HPLC/DAD.	3	n.d.	1.3
Monomethyl dibromodiphenyl methane (DBBT)	mg/kg	With reference to US EPA 8270D method. Analysis was performed by GC/MS.	0.5	n.d.	ĬĔ
Monomethyl dichlorodiphenyl methane (Ugilec121)	mg/kg	With reference to US EPA 8270D method. Analysis was performed by GC/MS.	0.5	n.d.	*
Monomethyl tetrachlorodiphenyl methane (Ugilec141)	mg/kg	With reference to US EPA 8270D method. Analysis was performed by GC/MS.	0.5	n.d.	
Halogen					
Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg		50	n.d.	
Halogen-Chlorine (CI) (CAS No.: 22537-15-1)	mg/kg	With reference to BS EN 14582:2007.	50	n.d.	
Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg	Analysis was performed by IC.	50	n.d.	-
Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg		50	n.d.	
Organic-tin compounds				The second	
Tributyl Tin (TBT)	mg/kg	With reference to DIN 38407-13.	0.03	n.d.	24.
Triphenyl Tin (TphT)	mg/kg	Analysis was performed by GC/FPD.	0.03	n.d.	



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Test Item(s)	Unit	Method	MDL	Result No.1	Limit
Asbestos					
Actinolite (CAS No.: 77536-66-4)	%	1	-	Negative	(-)
Amosite (CAS No.: 12172-73-5)	%	With reference to EPA 600/R-93/116	12	Negative	141
Anthophyllite (CAS No.: 77536-67- 5)	%	method. Analysis was performed by Stereo Microscope (SM), Dispersion	-	Negative	(8)
Chrysotile (CAS No.: 12001-29-5)	%	Staining Polarized Light Microscope	-	Negative	
Crocidolite (CAS No.: 12001-28-4)	%	(DS-PLM) and X-ray Diffraction Spectrometer (XRD).	17.50	Negative	-
Tremolite (CAS No.: 77536-68-6)	%			Negative	-
AZO					
1): 4-AMINODIPHENYL (CAS No.: 92-67-1)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	-
2): BENZIDINE (CAS No.: 92-87- 5)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	-
3): 4-CHLORO-O-TOLUIDINE (CAS No.: 95-69-2)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	
4): 2-NAPHTHYLAMINE (CAS No.: 91-59-8)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	1.0
5): O-AMINOAZOTOLUENE (CAS No.: 97-56-3)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	-
6): 2-AMINO-4-NITROTOLUENE (CAS No.: 99-55-8)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	-
7): P-CHLOROANILINE (CAS No.: 106-47-8)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	
8): 2,4-DIAMINOANISOLE (CAS No.: 615-05-4)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	
9): 4,4'- DIAMINODIPHENYLMETHANE (CAS No.: 101-77-9)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	
10): 3,3'-DICHLOROBENZIDINE (CAS No.: 91-94-1)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	
11): 3,3'-DIMETHOXYBENZIDINE (CAS No.: 119-90-4)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	•
12): 3,3'-DIMETHYLBENZIDINE (CAS No.: 119-93-7)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	4

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Test Item(s)	Unit	Method	MDL	Result	Limit
	Oille	Metriod	MIDL	No.1	
13): 3,3'-DIMETHYL-4,4'- DIAMINODIPHENYLMETHANE (CAS No.: 838-88-0)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	
14): P-CRESIDINE (2-METHOXY- 5-METHYLANILINE) (CAS No.: 120-71-8)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	-
15): 4,4'-METHYLENE-BIS- (2- CHLOROANILINE) (CAS No.: 101-14-4)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	4
16): 4,4'-OXYDIANILINE (CAS No.: 101-80-4)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	- 2
17): 4,4'-THIODIANILINE (CAS No.: 139-65-1)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	
18): O-TOLUIDINE (CAS No.: 95- 53-4)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	
19): 2,4-TOLUYLENEDIAMINE (CAS No.: 95-80-7)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	3
20): 2,4,5-TRIMETHYLANILINE (CAS No.: 137-17-7)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	3
21): O-ANISIDINE (CAS No.: 90- 04-0)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	-
22): P-AMINOAZOBENZENE (CAS No.: 60-09-3)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	
23): 2,4-XYLIDINE (CAS No.: 95- 68-1)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	-2
24): 2,6-XYLIDINE (CAS No.: 87- 62-7)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	
CFC's (Chlorofluorocarbons)					
Group I					
Chlorofluorocarbon-11 (CAS No.: 75-69-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
Chlorofluorocarbon-12 (CAS No.: 75-71-8)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	



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Test Item(s)	Unit	Method	MDL	Result No.1	Limit
Chlorofluorocarbon-113 (CAS No.: 76-13-1)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	4
Chlorofluorocarbon-114 (CAS No.: 76-14-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
Chlorofluorocarbon-115 (CAS No.: 76-15-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
Group III			-		
Chlorofluorocarbon-13 (CAS No.: 75-72-9)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	7.2
Chlorofluorocarbon-111 (CAS No.: 354-56-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	•
Chlorofluorocarbon-112 (CAS No.: 76-12-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
Chlorofluorocarbon-211 (CAS No.: 422-78-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	•
Chlorofluorocarbon-212 (CAS No.: 3182-26-1)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	Ī
Chlorofluorocarbon-213 (CAS No.: 2354-06-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	•
Chlorofluorocarbon-214 (CAS No.: 29255-31-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	9
Chlorofluorocarbon-215 (CAS No.: 4259-43-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	•

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Test Item(s)	Unit	Method	MDL	Result No.1	Limit
Chlorofluorocarbon-216 (CAS No.: 661-97-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
Chlorofluorocarbon-217 (CAS No.: 422-86-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFCs (Hydrochlorofluorocarbons)					
HCFC-21 (CAS No.: 75-43-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	- 1
HCFC-22 (CAS No.: 75-45-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
HCFC-31 (CAS No.: 593-70-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-121 (CAS No.: 354-14-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-122 (CAS No.: 354-21-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-123 (CAS No.: 306-83-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
HCFC-124 (CAS No.: 2837-89-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
HCFC-131 (CAS No.: 359-28-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	1-
HCFC-132b (CAS No.: 1649-08-7)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	•



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Toot Itom(s)	Links	Unit Method	MDL	Result	Limit
Test Item(s)	Unit	Wethod	MIDL	No.1	
HCFC-133a (CAS No.: 75-88-7)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	•
HCFC-141b (CAS No.: 1717-00-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	÷.
HCFC-142b (CAS No.: 75-68-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-221 (CAS No.: 422-26-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
HCFC-222 (CAS No.: 422-49-1)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-223 (CAS No.: 422-52-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-224 (CAS No.: 422-54-8)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-225ca (CAS No.: 422-56-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	19
HCFC-225cb (CAS No.: 507-55-1)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	2
HCFC-226 (CAS No.: 431-87-8)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-231 (CAS No.: 421-94-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-232 (CAS No.: 460-89-9)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	



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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF

Test Item(s)	Unit	Method	MDL	Result	Limit
				No.1	
HCFC-233 (CAS No.: 7125-84-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	2
HCFC-234 (CAS No.: 425-94-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
HCFC-235 (CAS No.: 460-92-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	10
HCFC-241 (CAS No.: 666-27-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
HCFC-242 (CAS No.: 460-63-9)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-3
HCFC-243 (CAS No.: 460-69-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	4
HCFC-244	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
HCFC-251 (CAS No.: 421-41-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	•
HCFC-252 (CAS No.: 819-00-1)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
HCFC-253 (CAS No.: 460-35-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-261 (CAS No.: 420-97-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-2
HCFC-262 (CAS No.: 421-02-03)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	



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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



Test Item(s)	Unit	Method	MDL	Result No.1	Limit
Halons					
Halon-1211 (CAS No.: 353-59-3)	mg/kg	With reference to US EPA 5021	1	n.d.	. . .
Halon-1301 (CAS No.: 75-63-8)	mg/kg	method. Analysis was performed by	1	n.d.	- 2
Halon-2402 (CAS No.: 124-73-2)	mg/kg	GC/MS.	1	n.d.	
CHCs (Chlorinate hydrocarbon)					
1,1,1,2-Tetrachloroethane (CAS No.: 630-20-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
1,1,1-Trichloroethane (CAS No.: 71-55-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
1,1,2,2-Tetrachloroethane (CAS No.: 79-34-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
1,1,2-Trichloroethane (CAS No.: 79-00-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
1,1-Dichloroethane (CAS No.: 75- 34-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
1,1-Dichloroethene (CAS No.: 75- 35-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
1,1-Dichloropropene (CAS No.: 563-58-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
1,2,3-Trichloropropane (CAS No.: 96-18-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	1.20
1,2-Dichloroethane (CAS No.: 107-06-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	7



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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF

Test Item(s)	Unit	Method	MDL	Result No.1	Limit
1,3-Dichloropropane (CAS No.: 142-28-9)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
2,2-Dichloropropane (CAS No.: 594-20-7)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	7.17
Carbon tetrachloride (CAS No.: 56-23-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	14
Chloroethane (CAS No.: 75-00-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
Chloroform (CAS No.: 67-66-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
Chloromethane (CAS No.: 74-87- 3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	•
cis-1,2-Dichloroethene (CAS No.: 156-59-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
cis-1,3-Dichloropropene (CAS No.: 10061-01-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
Hexachlorobutadiene (CAS No.: 87-68-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	2
Methylene Chloride (CAS No.: 75- 09-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
Tetrachloroethene (CAS No.: 127- 18-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	



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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF

Test Item(s)	Unit	Unit Method	MDL	Result No.1	Limit
	Omt	Wethod			
trans-1,2-Dichloroethene (CAS No.: 156-60-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
trans-1,3-Dichloropropene (CAS No.: 10061-02-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
Trichloroethylene (CAS No.: 79- 01-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
Sum of PBBs	mg/kg		-	n.d.	1000
Monobromobiphenyl	mg/kg	1	5	n.d.	
Dibromobiphenyl	mg/kg	1	5	n.d.	-
Tribromobiphenyl	mg/kg	1	5	n.d.	
Tetrabromobiphenyl	mg/kg	1	5	n.d.	-
Pentabromobiphenyl	mg/kg	1	5	n.d.	
Hexabromobiphenyl	mg/kg		5	n.d.	
Heptabromobiphenyl	mg/kg		5	n.d.	- 20
Octabromobiphenyl	mg/kg	1	5	n.d.	-
Nonabromobiphenyl	mg/kg		5	n.d.	141
Decabromobiphenyl	mg/kg	With reference to IEC 62321: 2008 and	5	n.d.	1 5
Sum of PBDEs	mg/kg	performed by GC/MS.		n.d.	1000
Monobromodiphenyl ether	mg/kg		5	n.d.	1
Dibromodiphenyl ether	mg/kg		5	n.d.	40
Tribromodiphenyl ether	mg/kg		5	n.d.	-
Tetrabromodiphenyl ether	mg/kg		5	n.d.	-
Pentabromodiphenyl ether	mg/kg		5	n.d.	-
Hexabromodiphenyl ether	mg/kg		5	n.d.	3-
Heptabromodiphenyl ether	mg/kg		5	n.d.	-
Octabromodiphenyl ether	mg/kg		5	n.d.	
Nonabromodiphenyl ether	mg/kg		5	n.d.	1 = 1 + 1
Decabromodiphenyl ether	mg/kg		5	n.d.	(-1

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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



Note:

- 1. mg/kg = ppm : 0.1wt% = 1000ppm
- 2. n.d. = Not Detected
- 3. MDL = Method Detection Limit
- 4. " " = Not Regulated
- 5. ** = Qualitative analysis (No Unit)
- 6. Negative = Undetectable / Positive = Detectable
- 7. Testing range of asbestos qualitative analysis is from less than 0.1% to 100%. The judgment criterion: asbestos fibers being found is shown as "Positive"; asbestos fibers not being found is shown as "Negative".

PFOS Reference Information : POPs - (EU) 757/2010

Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1µg/m².

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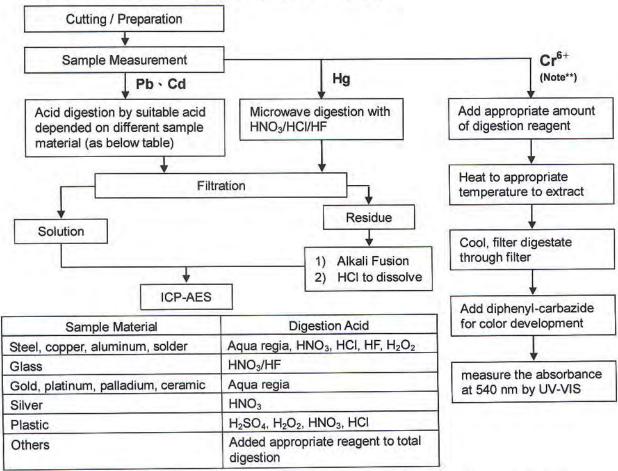


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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr6+ test method excluded)
- 2) Name of the person who made measurement: Climbgreat Yang
- 3) Name of the person in charge of measurement: Troy Chang



Note**: (1) For non-metallic material, add alkaline digestion reagent and heat to 90~95 ℃.

(2) For metallic material, add pure water and heat to boiling.

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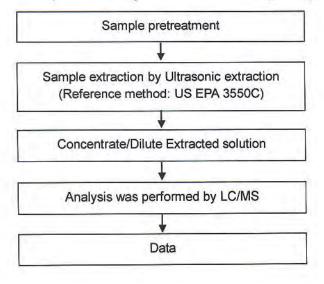
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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



PFOA/PFOS analytical flow chart of Ultrasonic extraction (LC/MS) procedure

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang



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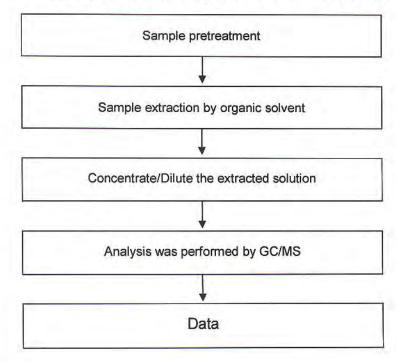
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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



PCTs analytical flow chart

- Name of the person who made measurement: Barry Tseng
- Name of the person in charge of measurement: Troy Chang



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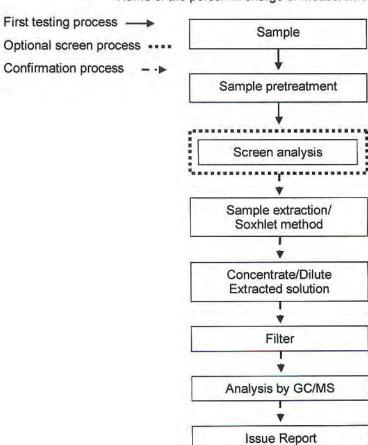
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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



PBB/PBDE analytical FLOW CHART

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang



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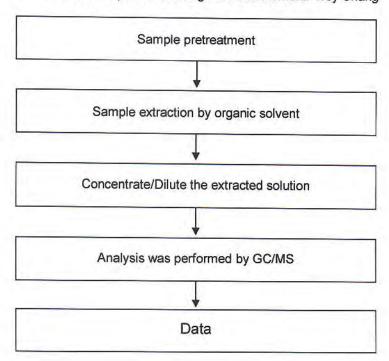
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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



PCBs analytical flow chart

Name of the person who made measurement: Barry Tseng Name of the person in charge of measurement: Troy Chang





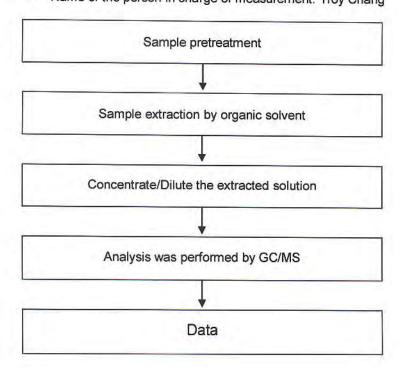
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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



Chlorinated Paraffins analytical flow chart

Name of the person who made measurement: Barry Tseng Name of the person in charge of measurement: Troy Chang



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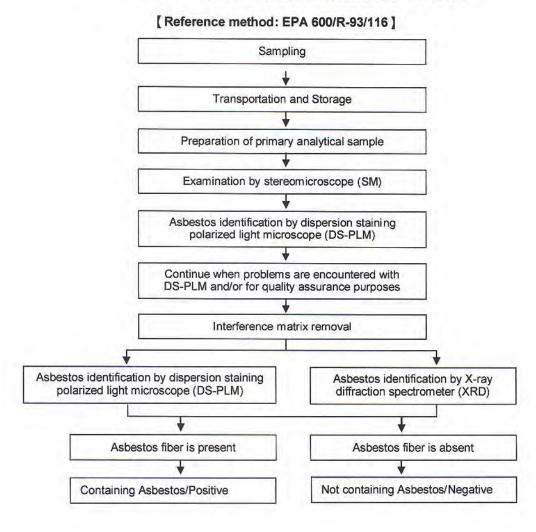
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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



Analysis flow chart for determination of Asbestos

- Name of the person who made measurement: Victor Kao
- Name of the person in charge of measurement: Wendy Wei



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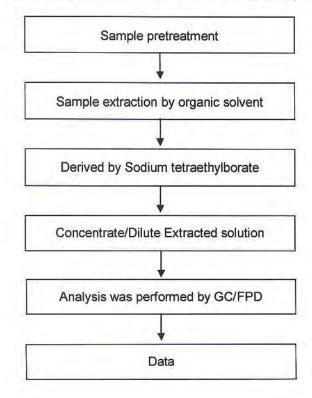
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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



Analytical flow chart of Organic-Tin content

- Name of the person who made measurement: Ginny Chen
- Name of the person in charge of measurement: Troy Chang





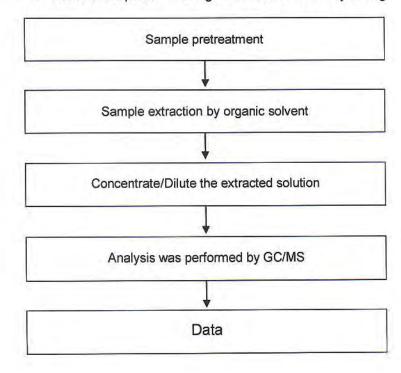
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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



PCNs analytical flow chart

- Name of the person who made measurement: Barry Tseng
- Name of the person in charge of measurement: Troy Chang



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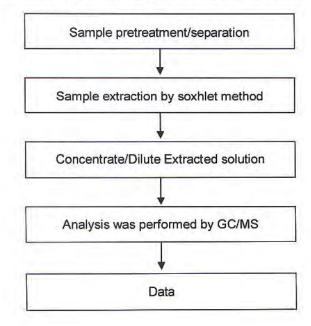
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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



Analytical flow chart of phthalate content

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang





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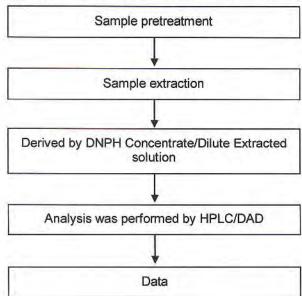
CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



Formaldehyde analytical flow chart

- Name of the person who made measurement: Scott Ku
- Name of the person in charge of measurement: Troy Chang

[Test Method : US EPA 8315A . ISO 17226-1]



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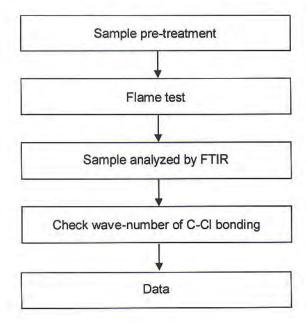
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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



Analysis flow chart for determination of PVC in material

- Name of the person who made measurement: Ginny Chen
- Name of the person in charge of measurement: Troy Chang



Member of the SGS Group



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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



DBBT analytical flow chart

- Name of the person who made measurement: Roman Wong Name of the person in charge of measurement: Troy Chang
 - Sample pretreatment/separation Sample extraction by soxhlet method Concentrate/Dilute Extracted solution Analysis was performed by GC/MS Data

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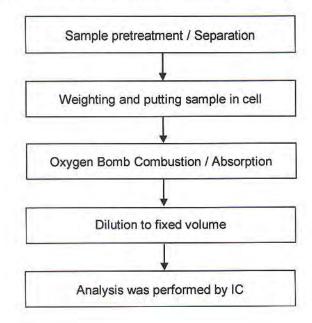
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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



Analytical flow chart of halogen content

- 1) Name of the person who made measurement: Rita Chen
- 2) Name of the person in charge of measurement: Troy Chang





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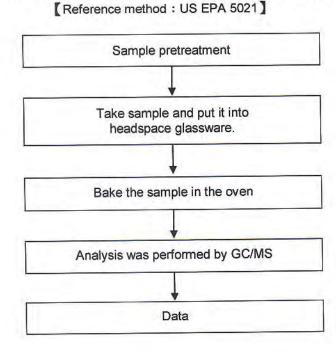
CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



Analytical flow chart of volatile organic compounds (VOCs)

Name of the person who made measurement: Chun Wu

Name of the person in charge of measurement: Shinjyh Chen



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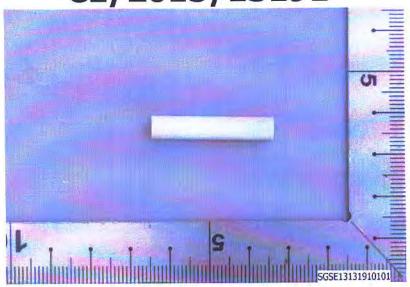
No.: CE/2013/13191 Date: 2013/01/21 Page: 29 of 29

CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



* The tested sample / part is marked by an arrow if it's shown on the photo. *

CE/2013/13191



** End of Report **

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company 张护元子至于 (1925) 此代 张龙元子 (1925) 正代 张龙元子 (1925) 正代 张龙元子 (1925) 正元 (1



No. SHAEC1219975401

Date: 19 Nov 2012

Page 1 of 7

3M CHINA LIMITED 222# TIAN LIN ROAD, SHANGHAI (200233)

The following sample(s) was/were submitted and identified on behalf of the clients as: 3M 3779-PG

SGS Job No. : SP12-033081 - SH

Date of Sample Received: 14 Nov 2012

Testing Period : 14 Nov 2012 - 19 Nov 2012

Test Requested: Selected test(s) as requested by client.

Test Method: Please refer to next page(s).

Test Results: Please refer to next page(s).

Conclusion: Based on the performed tests on submitted samples, the results of Lead,

Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE) comply with the limits as set by RoHS

Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of SGS-CSTC Ltd.

JJ Fan

Approved Signatory

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No. SHAEC1219975401

Date: 19 Nov 2012

Page 2 of 7

Test Results:

Test Part Description:

Specimen No. SGS Sample ID Description
1 SHA12-199754.001 Brown solid

Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

RoHS Directive 2011/65/EU

Test Method: With reference to IEC 62321:2008

(1) Determination of Cadmium by ICP-OES.

(2) Determination of Lead by ICP-OES.

(3) Determination of Mercury by ICP-OES.

(4) Determination of Hexavalent Chromium by Colorimetric Method using UV-Vis.

(5) Determination of PBBs / PBDEs content by GC-MS.

Test Item(s)	<u>Limit</u>	<u>Unit</u>	MDL	001
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	2	ND
Sum of PBBs	1000	mg/kg	+	ND
Monobromobiphenyl	19	mg/kg	5	ND
Dibromobiphenyl	4	mg/kg	5	ND
Tribromobiphenyl	1.4	mg/kg	5	ND
Tetrabromobiphenyl	(+)	mg/kg	5	ND
Pentabromobiphenyl		mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	Gé.	mg/kg	5	ND
Octabromobiphenyl	i i	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl		mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether		mg/kg	5	ND

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Test Report	No. SHAEC12199754	01	Date: 19	Nov 2012	Page 3 of 7
Test Item(s)	<u>Limit</u>	<u>Unit</u>	MDL	<u>001</u>	
Dibromodiphenyl ether		mg/kg	5	ND	
Tribromodiphenyl ether		mg/kg	5	ND	
Tetrabromodiphenyl ether	-	mg/kg	5	ND	
Pentabromodiphenyl ether		mg/kg	5	ND	
Hexabromodiphenyl ether	4	mg/kg	5	ND	
Heptabromodiphenyl ether		mg/kg	5	ND	
Octabromodiphenyl ether		mg/kg	5	ND	
Nonabromodiphenyl ether	-	mg/kg	5	ND	
Decabromodiphenyl ether	< <u>€</u>	mg/kg	5	ND	

Notes:

(1) The maximum permissible limit is quoted from the directive 2011/65/EU, Annex II

Hexabromocyclododecane (HBCDD)

Test Method: Determination of HBCDD by GC-MS based on IEC 62321:2008.

Test Item(s)	<u>Unit</u>	MDL	001
Hexabromocyclododecane (HBCDD)	mg/kg	10	ND

Notes:

(1) Reference Information: Directive 2011/65/EU recasting RoHS directive 2002/95/EC: Hexabromocyclododecane (HBCDD) is considered as a priority for risk evaluation and substance restriction.

Phthalates

Test Method: Determination of phthalates by GC-MS based on EN 14372:2004.

Test Item(s)	<u>Unit</u>	MDL	001
Dibutyl Phthalate (DBP)	%	0.003	ND
Benzylbutyl Phthalate (BBP)	%	0.003	ND
Bis-(2-ethylhexyl) Phthalate (DEHP)	%	0.003	ND

Notes:

(1) Reference Information: Directive 2011/65/EU recasting RoHS directive 2002/95/EC: Bis (2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP) and Dibutyl phthalate (DBP) are considered as a priority for risk evaluation and substance restriction.

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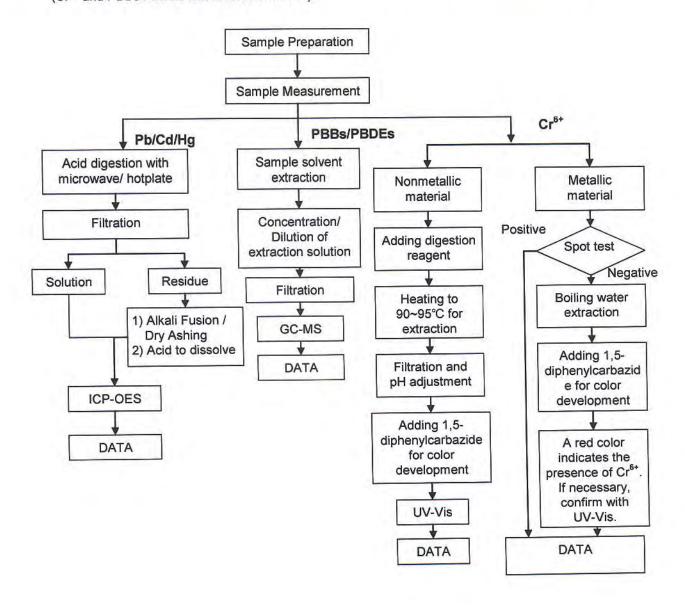
Date: 19 Nov 2012

Page 4 of 7

ATTACHMENTS

RoHS Testing Flow Chart

- 1) Name of the person who made testing: Jan Shi/Yoyo Wang/Allen Xiao/Gary Xu
- 2) Name of the person in charge of testing: Jeff Zhang/George Xu/ Linda Li
- These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ and PBBs/PBDEs test method excluded)



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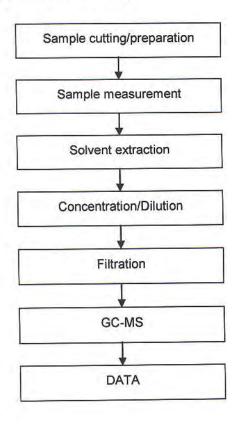
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Date: 19 Nov 2012

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Phthalates Testing Flow Chart

- 1) Name of the person who made testing: Elyn Yao
- 2) Name of the person in charge of testing: Rachel Zhang



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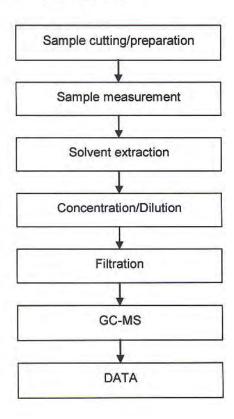
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Date: 19 Nov 2012

Page 6 of 7

HBCDD Testing Flow Chart

- 1) Name of the person who made testing: Gary Xu
- 2) Name of the person in charge of testing: Jessy Huang



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Sample photo:



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No. SHAEC1219975401

Date: 19 Nov 2012

Page 1 of 6

3M CHINA LIMITED 222# TIAN LIN ROAD, SHANGHAI (200233)

The following sample(s) was/were submitted and identified on behalf of the clients as: 3M 3779-PG

SGS Job No.: SP12-033081 - SH

Date of Sample Received: 14 Nov 2012

Testing Period: 14 Nov 2012 - 19 Nov 2012

Test Requested: Selected test(s) as requested by client.

Test Method: Please refer to next page(s).

Test Results: Please refer to next page(s).

Signed for and on behalf of SGS-CSTC Ltd.

JJ Fan

Approved Signatory

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No. SHAEC1219975401

Date: 19 Nov 2012

Page 2 of 6

Test Results:

Test Part Description:

Specimen No. SGS Sample ID Description

1 SHA12-199754.001 Brown solid

Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

Halogen

Test Method: With reference to EN 14582: 2007, analysis was performed by Ion Chromatograph (IC).

Test Item(s)	<u>Unit</u>	MDL	001
Fluorine (F)	mg/kg	50	ND
Chlorine (CI)	mg/kg	50	ND
Bromine (Br)	mg/kg	50	ND
lodine (I)	mg/kg	50	ND

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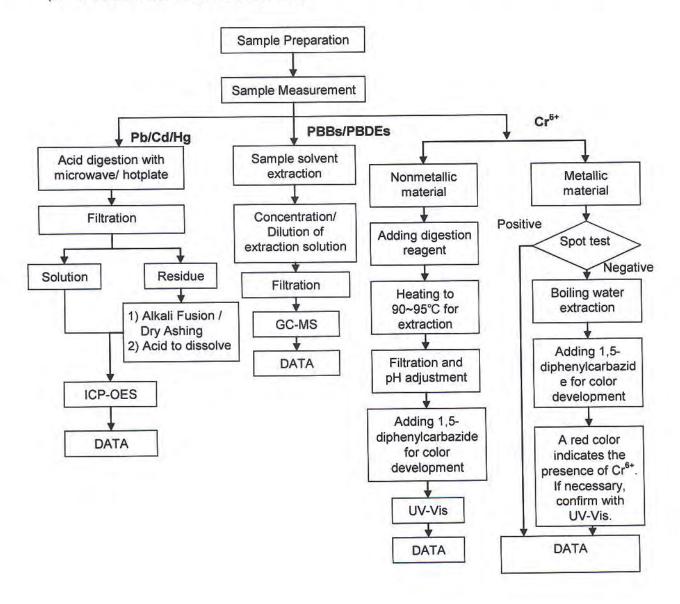
Date: 19 Nov 2012

Page 3 of 6

ATTACHMENTS

RoHS Testing Flow Chart

- 1) Name of the person who made testing: Jan Shi/Yoyo Wang/Allen Xiao/Gary Xu
- 2) Name of the person in charge of testing: Jeff Zhang/George Xu/ Linda Li
- These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ and PBBs/PBDEs test method excluded)



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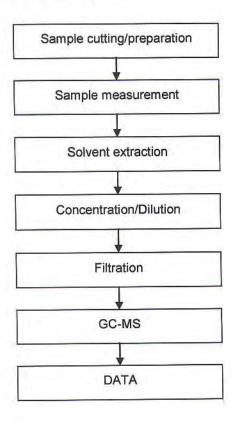
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Date: 19 Nov 2012

Page 4 of 6

Phthalates Testing Flow Chart

- 1) Name of the person who made testing: Elyn Yao
- 2) Name of the person in charge of testing: Rachel Zhang



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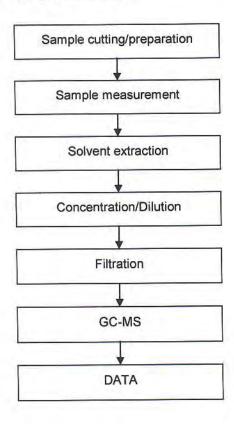
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HBCDD Testing Flow Chart

- 1) Name of the person who made testing: Gary Xu
- 2) Name of the person in charge of testing: Jessy Huang



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Sample photo:



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Intertek Consumer Goods GmbH - Würzburger Straße 152 - 90766 Fürtir

Polyfil AG Gina Gregorio Oberallmendstrasse 20A

6300 Zug / Switzerland

Fürth, 2013-06-31

Test report No. FUHL1236937E

Testing of a material sample according to the RoHS directive 2011/65/EC

Sample description: Ni42Fe58MCuMAg wire; part no. HL26351

Arrival in lab: 2012-012-04; Period of XRF analysis incl. sample preparation and photo documentation: 2012-12-07 - 2012-12-10 Period of analysis for the reorder: 2013-06-08 - 2013-06-29 Head of Inorganic Lab: Claudia List

Copying this test report is permitted only in agreement with the contracted lab. The test results refer only to the tested item. This report consists of 6 page(s).

The test methods signed with * are not listed in the attachment of the accreditation certificate.

Conclusion based on tested item

Test order	Status
testing according to the RoHS directive 2011/65/EC	pass

Please see overview of test results

- Test results see next pages -





Page 2 of 5 page(s) of our test report No. FUHL1236937E dated 2013-06-31

Sample description: Ni42Fe58MCuMAg wire; part no. HL26351

nM = non Metal M = Metal cM = composite Material

List of component parts:

Sample No.	Part No.	Material	Description	
236937	1	М	Ni42Fe58MCuMAg wire; part no. HL26351	

Photo:



Comment

LOD = Limit of Detection

BL = Below Limit
OL = Over Limit

X = Inconclusive, further test necessary

σ = Standard deviation

CS = Composite sample

Remark:

Results were obtained by EDXRF for primary screening. Additional chemical testing using ICP (for Cd, Pb), AAS (for Hg), IC-UC/VIS (for CrVI) and GC/MS (for PBBs/PBDEs) are recommended, if the concentration exceeds the below warning value according to IEC 62321.

Element	Unit	non - metal	metal
Cd	mg/kg	$BL \le (70-3\sigma) < X < (130+3\sigma) \le OL$	$BL \le (70-3\sigma) < X < (130+3\sigma) \le OL$
Pb	mg/kg	$BL \le (700-3\sigma) < X < (1300+3\sigma) \le OL$	$BL \le (700-3\sigma) < X < (1300+3\sigma) \le OL$
Hg	mg/kg	$BL \le (700-3\sigma) < X < (1300+3\sigma) \le OL$	$BL \le (700-3\sigma) < X < (1300+3\sigma) \le OL$
Br	mg/kg	BL ≤ (300-3σ) < X	
Cr	mg/kg	BL ≤ (700-3σ) < X	BL ≤ (700-3σ) < X

Element	Unit	composite material
Cd		$LOD < X < (150+3\sigma) \le OL$
Pb	mg / kg	$BL \le (500-3\sigma) < X < (1500+3\sigma) \le OL$
Hg	mg/kg	$BL \le (500-3\sigma) < X < (1500+3\sigma) \le OL$
Br		BL ≤ (250-3σ) < X
Cr	mg/kg	BL ≤ (500-3σ) < X



Page 3 of 5 page(s) of our test report No. FUHL1236937E dated 2013-06-31

Sample description: Ni42Fe58MCuMAg wire; part no. HL26351

1. XRF screening

Method:

XRF according to IEC 62321:2008*

Sample No.	Part No.	Pb	Hg	Cd	Crtotal	Br
236937	1	BL	BL	BL	BL	- 4

Status	
pass	

Analysis of reorder

2. Analysis of metals by ICP-MS, results in mg/kg

Method:

Pb, Cd, Cr: DIN EN ISO 17294-2**

Detection limit:

Digestion: with conc. HNO₃ + HCI** Pb 0.5 mg/kg, Cd 0.2 mg/kg, Cr 1 mg/kg, Hg: 0.1 mg/kg

Sample No.	Part No.	Pb	Hg	Cd	Cr _{total}
236937	1	<1	< 0.2	< 0.5	360

Status	
pass	

Comment:

Elements	RoHS-limit value
Lead (Pb)	1000 mg/kg
Mercury (Hg)	1000 mg/kg
Cadmium (Cd)	100 mg/kg
Chromium VI (Cr VI)	1000 mg/kg
Polybrominated Biphenyle (PBBs)	1000 mg/kg
Polybrominated Diphenyl ether (PBDEs)	1000 mg/kg

Intertek Consumer Goods GmbH

Prüfleitung / Lab Manager

□ A. Breunig, □ K. Grönhardt, □ Dr. K. Laue-Schuler, □ C. List, □ D. Löw

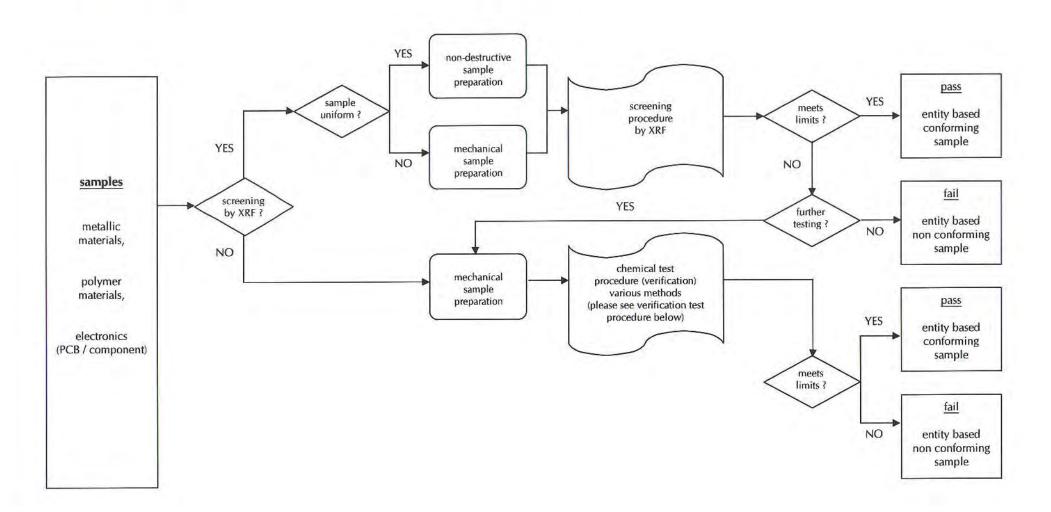
□ R. Micolay, □ M. Neumeister, □ Dr. R. Rätze, □ K. Scharrer, □ M. Tutsch

- Flow charts see next page(s) -



Page 4 of 5 page(s)

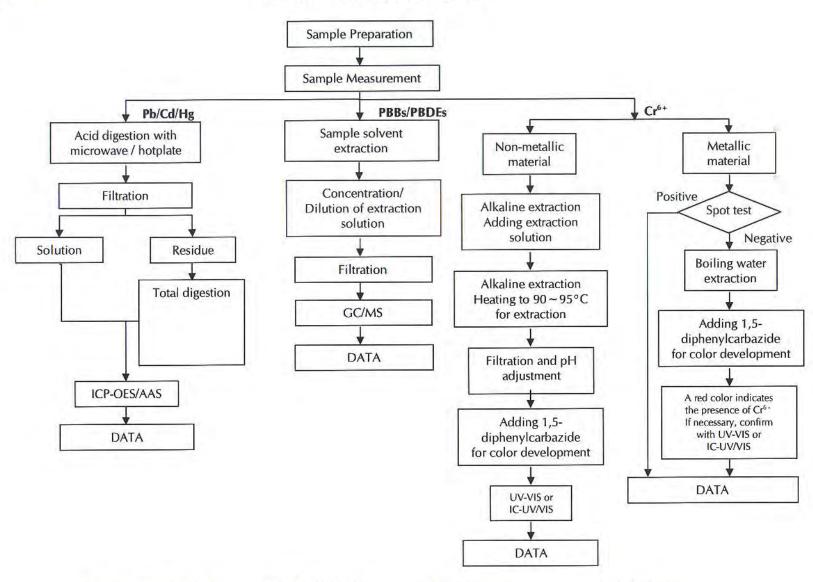
Test procedure





Page 5 of 5 page(s)

Verification test procedure



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Intertek Consumer Goods Gmbl- Würzburger Straße 152 · 90766 Furth

Polyfil AG Gina Gregorio Oberallmendstrasse 20A

6300 Zug / Switzerland

Fürth, 2013-06-29

Test report No. FUHL1236941E

Testing of a material sample according to the RoHS directive 2011/65/EC

Sample description: Ni99.9MAg wire

Arrival in lab: 2012-012-04; Period of XRF analysis incl. sample preparation and photo documentation: 2012-12-07 - 2012-12-10 Period of analysis for the reorder: 2013-06-08 - 2013-06-29 Head of Inorganic Lab: Claudia List

Copying this test report is permitted only in agreement with the contracted lab. The test results refer only to the tested item. This report consists of 6 page(s).

The test methods signed with * are not listed in the attachment of the accreditation certificate.

Conclusion based on tested item

Test order	Status
testing according to the RoHS directive 2011/65/EC	pass°

Please see overview of test results

- Test results see next pages -





Page 2 of 5 page(s) of our test report No. FUHL1236941E dated 2013-06-29

Sample description: Ni99.9MAg wire

nM = non Metal
M = Metal
cM = composite Material

List of component parts:

Sample No.	Part No.	Material	Description
236941	1	М	Ni99.9MAg wire

Photo:



Comment

LOD = Limit of Detection

BL = Below Limit
OL = Over Limit

X = Inconclusive, further test necessary

σ = Standard deviation

CS = Composite sample

Remark:

Results were obtained by EDXRF for primary screening. Additional chemical testing using ICP (for Cd, Pb), AAS (for Hg), IC-UC/VIS (for CrVI) and GC/MS (for PBBs/PBDEs) are recommended, if the concentration exceeds the below warning value according to IEC 62321.

Element	Unit	non - metal	metal
Cd	mg/kg	$BL \le (70-3\sigma) < X < (130+3\sigma) \le OL$	BL ≤ $(70-3\sigma)$ < X < $(130+3\sigma)$ ≤ OL
Pb	mg/kg	$BL \le (700-3\sigma) < X < (1300+3\sigma) \le OL$	$BL \le (700-3\sigma) < X < (1300+3\sigma) \le OL$
Hg		$BL \le (700-3\sigma) < X < (1300+3\sigma) \le OL$	$BL \le (700-3\sigma) < X < (1300+3\sigma) \le OL$
Br	mg/kg	BL ≤ (300-3σ) < X	-
Cr		BL ≤ (700-3σ) < X	BL ≤ (700-3σ) < X

Element	Unit	composite material
Cd		LOD < X < (150+3σ) ≤ OL
Pb	mg/kg	$BL \le (500-3\sigma) < X < (1500+3\sigma) \le OL$
Hg	mg / kg	$BL \le (500-3\sigma) < X < (1500+3\sigma) \le OL$
Br	mg/kg	BL ≤ (250-3σ) < X
Cr	mg / kg	BL ≤ (500-3σ) < X



Page 3 of 5 page(s) of our test report No. FUHL1236941E dated 2013-06-29

Sample description: Ni99.9MAg wire

1. XRF screening

Method:

XRF according to IEC 62321:2008*

Sample No.	Part No.	Pb	Hg	Cd	Crtotal	Br
236941	1	BL	BL	BL	BL	-

Status	
pass	

Analysis of reorder

2. Analysis of metals by ICP-MS, results in mg/kg

Method:

Pb, Cd, Cr: DIN EN ISO 17294-2**

Digestion: with conc. HNO₃ + HCI**

Detection limit:

Pb 0.5 mg/kg, Cd 0.2 mg/kg, Cr 1 mg/kg, Hg: 0.1 mg/kg

Sample No.	Part No.	Pb	Hg	Cd	Cr _{total}
236941	1	2	< 0.2	< 0.5	48

Status	
pass	

Comment:

Elements	RoHS-limit value
Lead (Pb)	1000 mg/kg
Mercury (Hg)	1000 mg/kg
Cadmium (Cd)	100 mg/kg
Chromium VI (Cr VI)	1000 mg/kg
Polybrominated Biphenyle (PBBs)	1000 mg/kg
Polybrominated Diphenyl ether (PBDEs)	1000 mg/kg

Intertek Consumer Goods GmbH

Prüfleitung / Lab Manager

□ A. Breunig, □ K. Grönhardt, □ Dr. K. Laue-Schuler, □ C. List, □ D. Löw

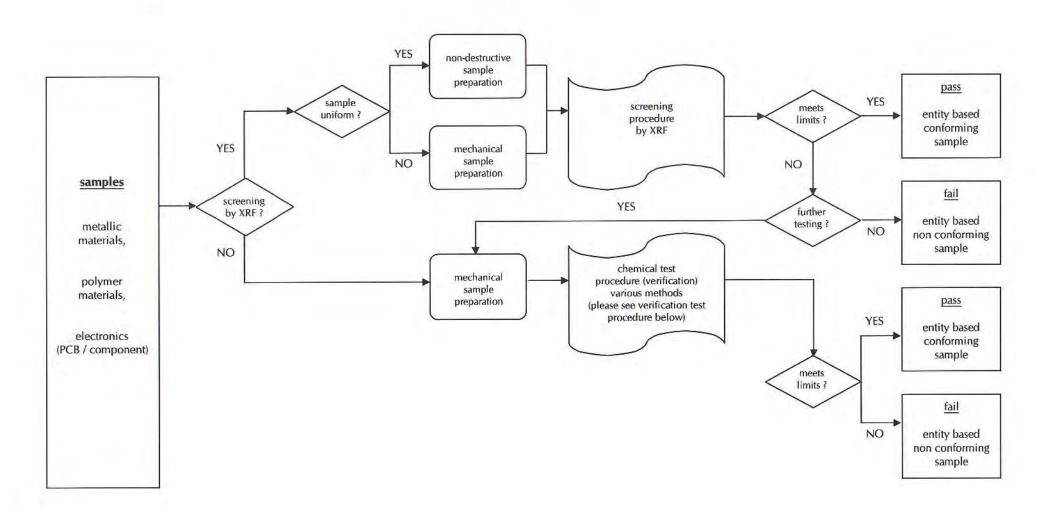
□ R. Micolay, □ M. Neumeister, □ Dr. R. Rätze, □ K. Scharrer, □ M. Tutsch

- Flow charts see next page(s) -



Page 4 of 5 page(s)

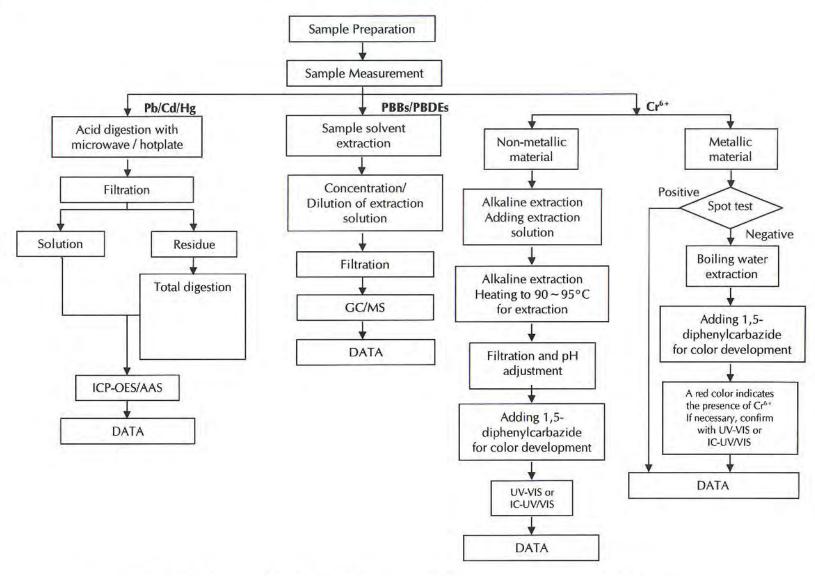
Test procedure





Page 5 of 5 page(s)

Verification test procedure





Test Report Number: SHAH0036227401

Applicant: ELSCHUKOM ELEKTROSCHUTZKOMPONENTENBAU

GEWERBESTRASSE 87, D-98669 VEILSDORF,

GERMANY

Sample Description:

Two(2) pieces of submitted samples said to be:

(1) Mixed all kinds of metal substrates.

(2) Mixed all kinds of plating layers.

Item Name : Silver Plated & Pure Silver Wires.

Item No. : (B-1) 101.014 -. ----

- silver plated copper wire - Cu, Ag--%

(B-2) 101.0131.----

- pure silver wire - Ag 1000

(B-3) 101.0123.0---

- silver plated purest nickel wire - Ni99.98%, Ag1%

(B-4) 101.0182.0---

- silver-copper alloy plated copper plated iron nickel alloy wire

Date:

JAN 18, 2013

- ElconD, AgCu5%

(B-5) 101.0120.0---

- silver plated constantan wire - CuNi44, Ag5%

(B-6) 101.0151.0---

- silver plated copper - nickel 44 alloy wire

- CuNi44, Ag10%

(B-7) 1050--31.----

pure silver strips – Ag 1000 pure

Country Of Origin Germany.

Tests Conducted:

As requested by the applicant, for details refer to attached page(s).

To Be Continued

Authorized by:

For intertek testing services Ltd., Shanghai

Jacob Lin

General Manager





Test Report SHAH0036227401 Number:

Tests Conducted

(A) Test result of RoHS Directive:

Testing item	<u>Result</u>
resund item	(1)
Cadmium (Cd) content (mg/kg)	ND
Lead (Pb) content (mg/kg)	ND
Mercury (Hg) content (mg/kg)	ND
Chromium (VI)(Cr ⁶⁺) result (by boiling water extraction on metal) (mg/kg with 50cm ²)	ND

Testing item	Result	
resung item	(2)	
Cadmium (Cd) content (mg/kg) /Plating	ND	
Lead (Pb) content (mg/kg) /Plating	ND	
Mercury (Hg) content (mg/kg) /Plating	ND	
Chromium (VI)(Cr ⁶⁺) result (by boiling water extraction on metal) (mg/kg with 50cm ²) /Plating	ND	

Remark: mg/kg with 50cm² = milligram per kilogram with 50 square centimeter

ND = not detected

(B) RoHS Requirement:

(b) None requirement:	
Restricted substances	Limits
Cadmium (Cd)	0.01% (100 mg/kg)
Lead (Pb)	0.1% (1000 mg/kg)
Mercury (Hg)	0.1% (1000 mg/kg)
Chromium (VI) (Cr ^{o+})	0.1% (1000 mg/kg)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(C) Test method:

Testing item	Testing method	Reporting limit
Cadmium (Cd) content	determined by ICP-OES.	2 mg/kg
Lead (Pb) content	determined by ICP-OES.	2 mg/kg
Mercury (Hg) content	With reference to IEC 62321 Edition 1.0: 2008, by acid digestion until the tested sample was totally dissolved, and determined by ICP-OES.	2 mg/kg
Chromium (VI) (Cr ⁶⁺) content (for metal)	With reference to IEC 62321 Edition 1.0: 2008, by boiling water extraction and determined by UV-VIS Spectrophotometer.	0.02mg/kg with 50cm ² (in testing solution)

Date sample received: Jan.14, 2013 Testing period: Jan.14, 2013 To Jan.17, 2013

To Be Continued

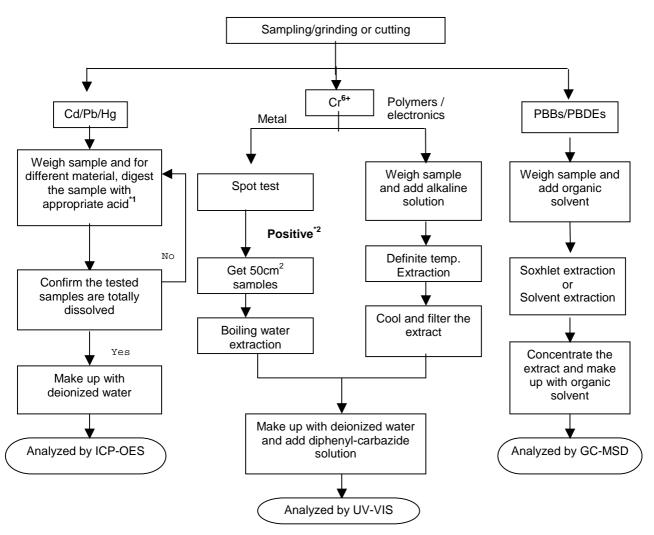


Test Report Number: SHAH0036227401

Tests Conducted

(D) Measurement flowchart:

Test for Cd/Pb/Hg/Cr (VI)/PBBs/PBDEs contents Reference standard: IEC 62321 Edition 1.0: 2008



Remarks:

*1: list of appropriate acid:

•	o. appropriate acid.		
	<u>Material</u>	Acid added for digestion	
	Polymers	HNO ₃ ,HCL,HF,H ₂ O ₂ ,H ₃ BO ₃	
	Metals	HNO ₃ ,HCL,HF	
	Electronics	HNO_{3} , HCL , $H_{2}O_{2}$, HBF_{4}	

*2: If the result of spot test is positive, Chromium VI would be determined as detected.

To Be Continued



Test Report Number: SHAH0036227401



To Be Continued



Test Report Number: SHAH0036227401

Tests Conducted



End Of Report

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Number: TWNC00296620 Test Report

Applicant: Elschukom Elektroschutzkomponentenbau

Gewerbestrasse 87, D-98669 Veilsdorf,

Germany

Sample Description:

One (1) group of submitted samples said to be :

Sample Description : Tin plated Wires

Style / Item No. :Please see page two to three.

Country of Origin :Germany Date Sample Received : Jan 23, 2013 Date Test Started :Jan 23, 2013

Test Conducted:

As requested by the applicant, for details please refer to attached pages.

Authorized by: On Behalf of Intertek Testing Services Taiwan Limited



K. Y. Liang Director



Date : Jan 30, 2013



Number: TWNC00296620 Test Report

```
Sample Description:
Style / Item No. : (A-1)101--271.0---
                   - tin plated copper wire - Cu, Sn--%
                   (A-2)101--283.0---
                   - tin plated, copper plated copper nickel alloy wire
                   - Elcon30, Sn--%
                   (A-3)101--272.0---
                   - tin plated, copper plated steel wire - ElconF, Sn--%
                   (A-4)101--281.0---
                   - tin plated, copper plated iron nickel alloy wire
                   - ElconD, Sn--%
                   (A-5)101--221.0---
                   - tin plated copper nickel alloy wire - CuNi44, Sn--%
                   (A-6)101--24-.0---
                   - tin plated, silver plated copper wire - Cu, Ag--%, Sn--%
                   (A-7)101--257.0---
                   - tin plated brass wire - Cu80Zn20, Sn--%
```

Authorized by: On Behalf of Intertek Testing Services Taiwan Limited



K. Y. Liang Director





Number: TWNC00296620 Test Report

```
Sample Description:
Style / Item No.
                  : (A-9)101--234.0---
                   - tin plated silver copper alloy wire
                   - AgCu90, Sn--% (ElCu90, Sn--%)
                   (A-10)101--255.----
                   - tin plated copper zinc alloy wire - Cu70Zn30, Sn--%
                   (A-11)101--229.---
                   - tin plated copper nickel alloy wire - CuNi12, Sn--%
                   (A-12)101--235.---
                   - tin plated silver copper alloy wire - Ag72Cu28, Sn--%
                   (A-13)101--231.----
                   - tin plated silver wire - Ag1000, Sn--%
                   (A-14)101--236.---
                   - tin plated silver copper alloy wire
                   - Ag45Cu55, Sn--%(AgCu55, Sn)
                   (A-15)101--266.----
                   - tin plated silver copper alloy wire
                   - AgCu70, Sn--%(ElCu70, Sn)
                   (A-16)101--238.----
                   - tin plated silver copper alloy wire
                   - AgCu80, Sn--%(Elcu80, Sn)
                   (A-17)101--228.0---
                   - tin plated tungsten wire - W, Sn
```

Authorized by: On Behalf of Intertek Testing Services Taiwan Limited



K. Y. Liang Director





Test Conducted

(I) Test Result Summary:

Test Item	<u>Unit</u>	Test Method	Result Mixed all kinds of metal wire	RL
Heavy Metal				
Cadmium (Cd) content	ppm	With reference to IEC 62321: 2008, by microwave digestion and determined by ICP-OES.	ND	2
Lead (Pb) content	ppm	With reference to IEC 62321: 2008, by microwave digestion and determined by ICP-OES.	37	2
Mercury (Hg) content	ppm	With reference to IEC 62321: 2008, by microwave digestion and determined by ICP-OES.	ND	2
Chromium VI (Cr ⁶⁺) content	mg/kg with 50 cm ²	With reference to IEC 62321: 2008, by boiling water extraction and determined by UV-Vis Spectrophotometer.	Negative (#)	0.02

ppm = parts per million based on weight of tested sample = mg/kg Remarks:

> = Not detected ND

= Reporting Limit, Quantitation limit of analyte in sample mg/kg with 50cm² = milligram per kilogram with 50 square centimeter

Negative = A negative test result indicated positive observation was not found at the time of Test. When the spot test showed a negative result, the boiling water extraction procedure shall be used to verify the result.

= Due to the insufficient sample area, reduced total sample surface of $10~{\rm cm}^2$ was used and the dilution factor was adjusted accordingly.

Responsibility of Chemist: Kevin Liu/ Irene Chiou

Date Sample Received : Jan 23, 2013

Test Period : Jan 23, 2013 To Jan 29, 2013





Test Conducted

(${\rm I\hspace{-.1em}I}$) RoHS Limits:

Restricted Substances	<u>Limits</u>
Cadmium (Cd) content	0.01% (100ppm)
Lead (Pb) content	0.1% (1000ppm)
Mercury (Hg) content 0.1% (1000ppm)	
Chromium VI (Cr ⁶⁺) content	0.1% (1000ppm)

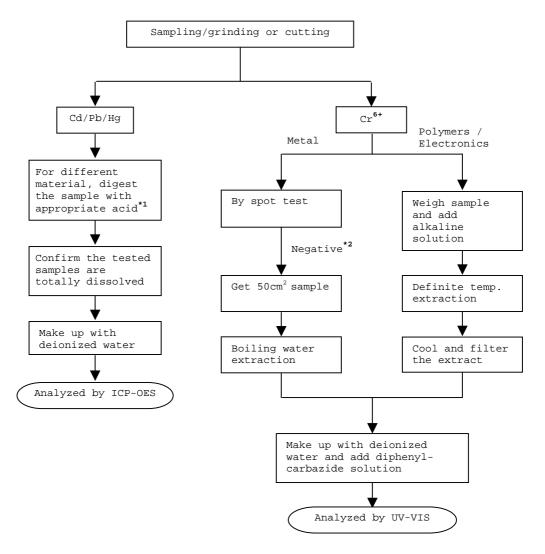
The above limits were quoted from Annex II of 2011/65/EU for homogeneous material.





Test Conducted

Test for Cd/Pb/Hg/Chromium (VI) Reference Standard: IEC 62321 edition 1.0:2008







Test Conducted

Remarks:

*1: List of Appropriate Acid:

<u>Material</u>	Acid Added for Digestion
Polymers	HNO_3 , $HC1$, HF , H_2O_2 , H_3BO_3
Metals	HNO ₃ , HCl, HF
Electronics	HNO_3 , HCl , H_2O_2 , HBF_4

*2: If the result of spot test is positive, Chromium VI would be determined as

End of Report

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Test Conducted

<u>Photo</u>









Test Report No. SHAEC1317518856 A01 Date: 16 Sep 2013 Page 1 of 5

ZHEJIANG ASIA GENERAL SOLDERING&BRAZING MATERIAL CO., LTD
XIHU INDUSTRIAL PARK, SANDUN, HANGZHOU CITY, ZHEJIANG, PROVINCE, CHINA

THIS REPORT IS TO SUPERSEDE TEST REPORT NO.SHAEC1317518837, DATE:2013/09/06.

The following sample(s) was/were submitted and identified on behalf of the clients as : LEAD-FREE SOLDER WIRE

SGS Job No. : SP13-026309 - SH

Model No. : YTW206(692529)

Composition : Sn0.3Ag0.7CuCe

Date of Sample Received : 03 Sep 2013

Testing Period: 03 Sep 2013 - 06 Sep 2013

Test Requested : Selected test(s) as requested by client.

Test Method: Please refer to next page(s).

Test Results: Please refer to next page(s).

Conclusion: Based on the performed tests on submitted samples, the results of Lead,

Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE) comply with the limits as set by RoHS

Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of SGS-CSTC Ltd.

JJ Fan

Approved Signatory

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In less otherwise stated the results shown in this test report refer only to the sample(s) tested.



No. SHAEC1317518856 A01 Date: 16 Sep 2013 Page 2 of 5

Test Results:

Test Part Description:

Specimen No. SGS Sample ID Description

1 SHA13-175188.032 Silvery metal wire

Remarks:

- (1) 1 mg/kg = 1 ppm = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

RoHS Directive 2011/65/EU

Test Method: (1) With reference to IEC 62321-5:2013, determination of Cadmium by ICP-OES.

(2) With reference to IEC 62321-5:2013, determination of Lead by ICP-OES.

(3) With reference to IEC 62321-4:2013, determination of Mercury by ICP-OES.

(4) With reference to IEC 62321:2008, determination of Hexavalent Chromium by spot test / Colorimetric Method using UV-Vis.

(5) With reference to IEC 62321:2008, determination of PBBs and PBDEs by GC-MS.

Test Item(s)	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>032</u>
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	40
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	-	-	\Diamond	Negative
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND

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t E&E (86-21) 61402553 f E&E (86-21) 64953679 HL: (86-21) 61402594 HL: (86-21) 54500353



Test Report	No. SHAEC13175188	56 A01	Date: 16	Sep 2013	Page 3 of 5
Test Item(s)	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>032</u>	
Dibromodiphenyl ether	-	mg/kg	5	ND	
Tribromodiphenyl ether	-	mg/kg	5	ND	
Tetrabromodiphenyl ether	-	mg/kg	5	ND	
Pentabromodiphenyl ether	-	mg/kg	5	ND	
Hexabromodiphenyl ether	-	mg/kg	5	ND	
Heptabromodiphenyl ether	-	mg/kg	5	ND	
Octabromodiphenyl ether	-	mg/kg	5	ND	
Nonabromodiphenyl ether	-	mg/kg	5	ND	
Decabromodiphenyl ether	-	mg/kg	5	ND	

Notes:

- (1) The maximum permissible limit is quoted from directive 2011/65/EU, Annex II
- (2) \$Spot-test:

Negative = Absence of Cr(VI) coating, Positive = Presence of Cr(VI) coating;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result is Negative or cannot be confirmed.)

◇Boiling-water-extraction:

Negative = Absence of Cr(VI) coating

Positive = Presence of Cr(VI) coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.

Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.

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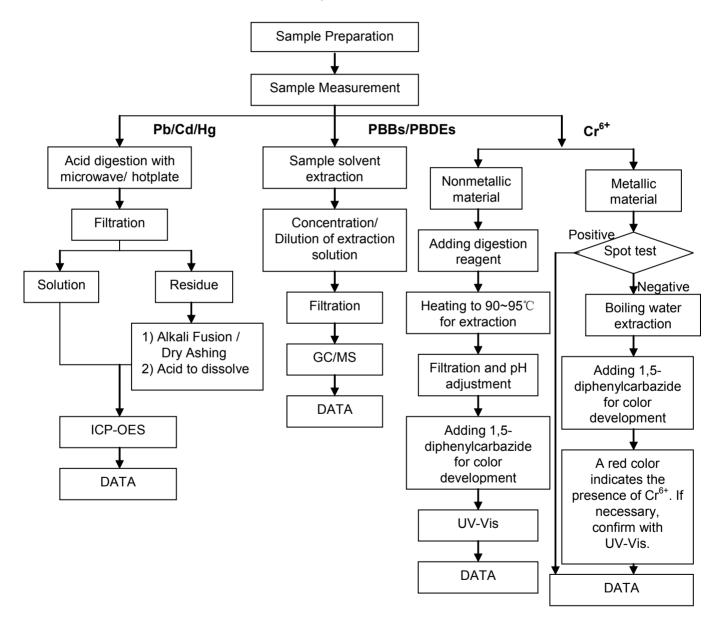
Date: 16 Sep 2013

Page 4 of 5

ATTACHMENTS

RoHS Testing Flow Chart

- 1) Name of the person who made testing: Jan Shi/Star Wang/Shara Wang/Gary Xu
- 2) Name of the person in charge of testing: Jeff Zhang/George Xu/ Jessy Huang
- 3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ and PBBs/PBDEs test method excluded)



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In the company is a sunday of the content or appearance of the sample(s) tested.



No. SHAEC1317518856 A01 Date: 16 Sep 2013 Page 5 of 5

Sample photo:



SGS authenticate the photo on original report only

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No. CANEC1309341001

Date: 25 Jun 2013

Page 1 of 4

AIM SOLDER (SHEN ZHEN) CO.,LTD.

NO.264 XIANGSHAN ROAD, LUOTIAN VILLAGE, SONGGANG TOWN, BAOAN DISTRICT, SHENZHEN CITY CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : SOLDER WIRE AIM 230 FAST CORE H RSA605

SGS Job No.:

CP13-031878 - SZ

Date of Sample Received:

20 Jun 2013

Testing Period:

20 Jun 2013 - 25 Jun 2013

Test Requested:

Selected test(s) as requested by client.

Test Method:

Please refer to next page(s).

Test Results:

Please refer to next page(s).

Conclusion:

Based on the performed tests on submitted samples, the results of Lead,

Mercury, Cadmium, Hexavalent chromium comply with the limits as set by RoHS

Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of SGS-CSTC Ltd.

Trophy Zhang Approved Signatory

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No. CANEC1309341001

Date: 25 Jun 2013

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Test Results:

Test Part Description:

Description SGS Sample ID Specimen No. Silvery metal wire CAN13-093410.001 1

Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

RoHS Directive 2011/65/EU

Test Method: With reference to IEC 62321:2008

- (1) Determination of Cadmium by ICP-OES.
- (2) Determination of Lead by ICP-OES.
- (3) Determination of Mercury by ICP-OES.
- (4) Determination of Hexavalent Chromium by Spot test / Colorimetric Method using UV-Vis.

Test Itom/s	Limit	<u>Unit</u>	MDL	001
Test Item(s)	100	mg/kg	2	ND
Cadmium (Cd)	1,000	mg/kg	2	127
Lead (Pb)	1,000	mg/kg	2	ND
Mercury (Hg) Hexavalent Chromium (CrVI)	712.00	-	\Diamond	Negative

Notes:

(1) The maximum permissible limit is quoted from the directive 2011/65/EU, Annex II

(2) Spot-test:

Negative = Absence of CrVI coating, Positive = Presence of CrVI coating;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result is Negative or cannot be confirmed.)

◇Boiling-water-extraction:

Negative = Absence of CrVI coating

Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

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No. CANEC1309341001

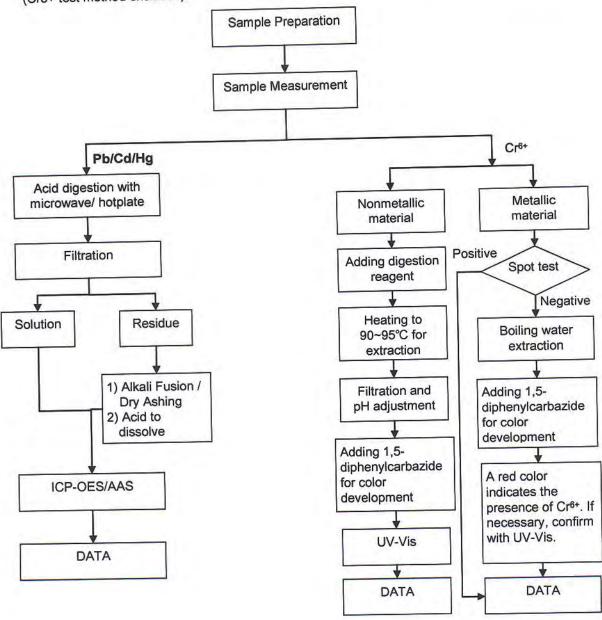
Date: 25 Jun 2013

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ATTACHMENTS

RoHS Testing Flow Chart

- 1) Name of the person who made testing: Michael Tso
- 2) Name of the person in charge of testing: Adams Yu
- 3) These samples were dissolved totally by pre-conditioning method according to below flow chart (Cr6+ test method excluded).



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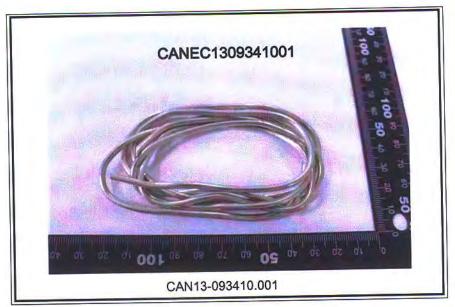


No. CANEC1309341001

Date: 25 Jun 2013

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Sample photo:



SGS authenticate the photo on original report only

*** End of Report ***

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The company is a stated the results shown in this test report refer only to the sample(s) tested.



APPLICANT: LITTELFUSE, INC. DATE: DEC 13, 2012

800 E. NORTHWEST HWY ΑT A.DIVIETRO/D.UNTIEDT

SAMPLE DESCRIPTION:

ONE (1) SUBMITTED SAMPLE SAID TO BE WHITE POWDER.

ITEM NAME FILLER. PART NO. 090187.

TESTS CONDUCTED:

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

AUTHORIZED BY: FOR INTERTEK TESTING SERVICES LTD., SHANGHAI

JACOB LIN

GENERAL MANAGER



TEST REPORT

TESTS CONDUCTED

(I) Test Result Summary:

TESTING ITEM R	ESULT (ppm)
HEAVY METAL	
CADMIUM (Cd) CONTENT	ND
LEAD (Pb) CONTENT	ND
MERCURY (Hg) CONTENT	ND
CHROMIUM VI (Cr6+) CONTENT	ND
POLYBROMINATED BIPHENYLS (PBBs)	·
MONOBROMINATED BIPHENYLS (MonoBB)	ND
DIBROMINATED BIPHENYLS (DIBB)	ND
TRIBROMINATED BIPHENYLS (TriBB)	ND
TETRABROMINATED BIPHENYLS (TetraBB)	ND
PENTABROMINATED BIPHENYLS (PentaBB)	ND
HEXABROMINATED BIPHENYLS (HexaBB)	ND
HEPTABROMINATED BIPHENYLS (HeptaBB)	ND
OCTABROMINATED BIPHENYLS (OctaBB)	ND
NONABROMINATED BIPHENYLS (NonaBB)	ND
DECABROMINATED BIPHENYL (DecaBB)	ND
POLYBROMINATED DIPHENYL ETHERS (PBDEs)	
MONOBROMINATED DIPHENYL ETHERS (MonoBDE)	ND
DIBROMINATED DIPHENYL ETHERS (DIBDE)	ND
TRIBROMINATED DIPHENYL ETHERS (TriBDE)	ND
TETRABROMINATED DIPHENYL ETHERS (TetraBDE)	ND
PENTABROMINATED DIPHENYL ETHERS (PentaBDE)	ND
HEXABROMINATED DIPHENYL ETHERS (HexaBDE)	ND
HEPTABROMINATED DIPHENYL ETHERS (HeptaBDE)	ND
OCTABROMINATED DIPHENYL ETHERS (OctaBDE)	ND
NONABROMINATED DIPHENYL ETHERS (NonaBDE)	ND
DECABROMINATED DIPHENYL ETHER (DecaBDE)	ND

NUMBER: SH AH00355828

ppm = PARTS PER MILLION = mg/kg **REMARKS:**

ND = NOT DETECTED

(II) ROHS REQUIREMENT:

(II) NOTO REGUIRENT:	
RESTRICTED SUBSTANCES LIM	ITS
CADMIUM (Cd) CONTENT	0.01% (100ppm)
LEAD (Pb) CONTENT	0.1% (1000ppm)
MERCURY (Hg) CONTENT	0.1% (1000ppm)
CHROMIUM VI (Cr ⁶⁺) CONTENT	0.1% (1000ppm)
POLYBROMINATED BIPHENYLS (PBBs)	0.1% (1000ppm)
POLYBROMINATED DIPHENYL ETHERS (PBDEs)	0.1% (1000ppm)

THE ABOVE LIMITS WERE QUOTED FROM ROHS DIRECTIVE 2002/95/EC AND AMENDMENT 2005/618/EC FOR HOMOGENEOUS MATERIAL.



TEST REPORT

TESTS CONDUCTED

(I) Test Result Summary:

TESTING ITEM R	ESULT (ppm)
HALOGEN CONTENT	
FLUORINE (F)	ND
CHLORINE (CI)	ND
BROMINE (Br)	ND
IODINE (I)	ND

NUMBER: SH

AH00355828

ppm = PARTS PER MILLION = mg/kg **REMARKS:**

ND = NOT DETECTED

(III) TEST METHOD:

TESTING ITEM T	ESTING METHOD	REPORTING LIMIT
IHAI ()(=EN (()NI EN I	WITH REFERENCE TO EN 14582:2007 BY COMBUSTION FLASK WITH OXYGEN AND DETERMINED BY ION CHROMATOGRAPHY	50 ppm



TESTS CONDUCTED

(III) TEST METHOD:

(m) reor merrios.		
TESTING ITEM T	ESTING METHOD	REPORTING LIMIT
CADMIUM (Cd) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN CLAUSE 8/9/10, BY MICROWAVE DIGESTION UNTIL THE TESTED SAMPLES ARE TOTALLY DISSOLVED AND DETERMINED BY ICP-OES.	2 ppm
LEAD (Pb) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN CLAUSE 8/9/10, BY MICROWAVE DIGESTION UNTIL THE TESTED SAMPLES ARE TOTALLY DISSOLVED AND DETERMINED BY ICP-OES.	2 ppm
MERCURY (Hg) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN CLAUSE 7, BY MICROWAVE DIGESTION UNTIL THE TESTED SAMPLES ARE TOTALLY DISSOLVED AND DETERMINED BY ICP-OES.	2 ppm
CHROMIUM VI (CR ⁶⁺) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN ANNEX C, BY ALKALINE DIGESTION AND DETERMINED BY UV-VIS SPECTROPHOTOMETER.	1 ppm
POLYBROMINATED BIPHENYLS (PBBs)	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN ANNEX A, BY SOLVENT EXTRACTION AND DETERMINED BY GC-MSD AND FURTHER HPLC CONFIRMATION WHEN NECESSARY.	5 ppm
POLYBROMINATED DIPHENYL ETHERS (PBDEs)	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN ANNEX A, BY SOLVENT EXTRACTION AND DETERMINED BY GC-MSD AND FURTHER HPLC CONFIRMATION WHEN NECESSARY.	5 ppm

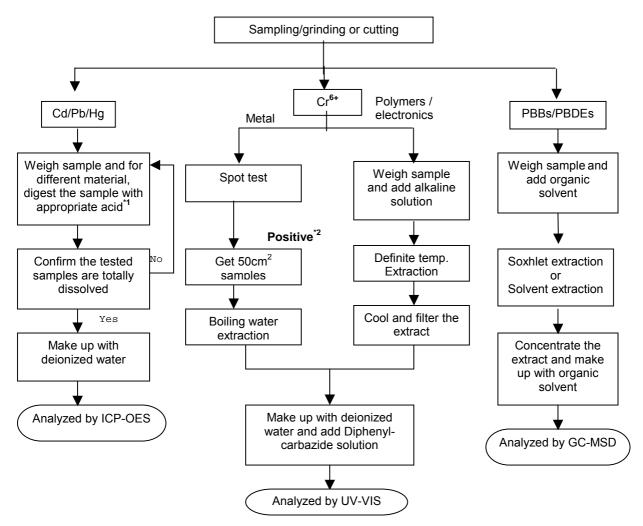
REMARK: REPORTING LIMIT = QUANTITATION LIMIT OF ANALYZE IN SAMPLE



TESTS CONDUCTED

(IV) MEASUREMENT FLOWCHART:

TEST FOR Cd/ Pb/ Hg/Cr (VI)/ PBBS/PBDES CONTENTS REFERENCE STANDARD: IÉC 62321 EDITION 1.0:2008



REMARKS:

*1: LIST OF APPROPRIATE ACID:

MATERIAL	ACID ADDED FOR DIGESTION
POLYMERS HNO	_{3,} HCL,HF,H ₂ O _{2,} H ₃ BO ₃
METALS HNO	_{3,} HCL,HF
ELECTRONICS HNO	3,HCL,H ₂ O ₂ ,HBF ₄

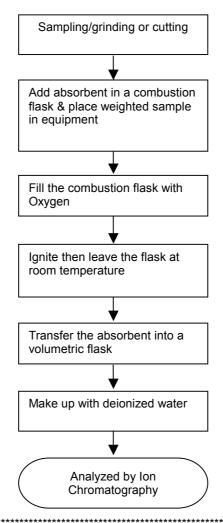
*2: IF THE RESULT OF SPOT TEST IS POSITIVE, CHROMIUM (VI) WOULD BE DETERMINED AS DETECTED.



TEST REPORT

TESTS CONDUCTED

(V) MEASUREMENT FLOWCHART: TEST FOR HALOGEN CONTENT REFERENCE STANDARD: EN 14582



NUMBER: SH

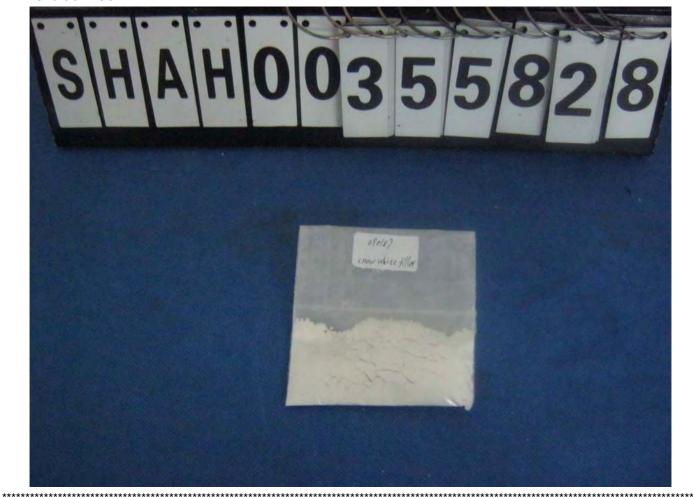
AH00355828



TEST REPORT

TESTS CONDUCTED

NUMBER: SH AH00355828



END OF REPORT

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APPLICANT: LITTELFUSE, INC. DATE: DEC 13, 2012

800 E. NORTHWEST HWY ΑT A.DIVIETRO/D.UNTIEDT

SAMPLE DESCRIPTION:

ONE(1) SUBMITTED SAMPLE SAID TO BE BEIGE POWDER.

ITEM NAME FILLER. PART NO. 090184.

TESTS CONDUCTED:

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

AUTHORIZED BY: FOR INTERTEK TESTING SERVICES LTD., SHANGHAI

JACOB LIN

GENERAL MANAGER



TESTS CONDUCTED

1 (I) Test Result Summary:

TESTING ITEM R	ESULT (ppm)
HEAVY METAL	
CADMIUM (Cd) CONTENT	ND
LEAD (Pb) CONTENT	ND
MERCURY (Hg) CONTENT	ND
CHROMIUM VI (Cr ⁶⁺) CONTENT	ND
POLYBROMINATED BIPHENYLS (PBBs)	
MONOBROMINATED BIPHENYLS (MonoBB)	ND
DIBROMINATED BIPHENYLS (DiBB)	ND
TRIBROMINATED BIPHENYLS (TriBB)	ND
TETRABROMINATED BIPHENYLS (TetraBB)	ND
PENTABROMINATED BIPHENYLS (PentaBB)	ND
HEXABROMINATED BIPHENYLS (HexaBB)	ND
HEPTABROMINATED BIPHENYLS (HeptaBB)	ND
OCTABROMINATED BIPHENYLS (OctaBB)	ND
NONABROMINATED BIPHENYLS (NonaBB)	ND
DECABROMINATED BIPHENYL (DecaBB)	ND
POLYBROMINATED DIPHENYL ETHERS (PBDEs)	
MONOBROMINATED DIPHENYL ETHERS (MonoBDE)	ND
DIBROMINATED DIPHENYL ETHERS (DIBDE)	ND
TRIBROMINATED DIPHENYL ETHERS (TriBDE)	ND
TETRABROMINATED DIPHENYL ETHERS (TetraBDE)	ND
PENTABROMINATED DIPHENYL ETHERS (PentaBDE)	ND
HEXABROMINATED DIPHENYL ETHERS (HexaBDE)	ND
HEPTABROMINATED DIPHENYL ETHERS (HeptaBDE)	ND
OCTABROMINATED DIPHENYL ETHERS (OctaBDE)	ND
NONABROMINATED DIPHENYL ETHERS (NonaBDE)	ND
DECABROMINATED DIPHENYL ETHER (DecaBDE)	ND

REMARKS: ppm = PARTS PER MILLION = mg/kg

ND = NOT DETECTED

RESPONSIBILITY OF CHEMIST: DENT FANG / LEAF LIU

(II) ROHS REQUIREMENT:

RESTRICTED SUBSTANCES LIM	ITS
CADMIUM (Cd) CONTENT	0.01% (100ppm)
LEAD (Pb) CONTENT	0.1% (1000ppm)
MERCURY (Hg) CONTENT	0.1% (1000ppm)
CHROMIUM VI (Cr ⁶⁺) CONTENT	0.1% (1000ppm)
POLYBROMINATED BIPHENYLS (PBBs)	0.1% (1000ppm)
POLYBROMINATED DIPHENYL ETHERS (PBDEs)	0.1% (1000ppm)

THE ABOVE LIMITS WERE QUOTED FROM ROHS DIRECTIVE 2002/95/EC AND AMENDMENT 2005/618/EC FOR HOMOGENEOUS MATERIAL.



TESTS CONDUCTED

(III) TEST METHOD:

(III) ILOI WEITIOD.		
TESTING ITEM T	ESTING METHOD	REPORTING LIMIT
CADMIUM (Cd) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN CLAUSE 8/9/10, BY MICROWAVE DIGESTION UNTIL THE TESTED SAMPLES ARE TOTALLY DISSOLVED AND DETERMINED BY ICP-OES.	2 ppm
LEAD (Pb) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN CLAUSE 8/9/10, BY MICROWAVE DIGESTION UNTIL THE TESTED SAMPLES ARE TOTALLY DISSOLVED AND DETERMINED BY ICP-OES.	2 ppm
MERCURY (Hg) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN CLAUSE 7, BY MICROWAVE DIGESTION UNTIL THE TESTED SAMPLES ARE TOTALLY DISSOLVED AND DETERMINED BY ICP-OES.	2 ppm
CHROMIUM VI (CR ⁶⁺) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN ANNEX C, BY ALKALINE DIGESTION AND DETERMINED BY UV-VIS SPECTROPHOTOMETER.	1 ppm
POLYBROMINATED BIPHENYLS (PBBs)	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN ANNEX A, BY SOLVENT EXTRACTION AND DETERMINED BY GC-MSD AND FURTHER HPLC CONFIRMATION WHEN NECESSARY.	5 ppm
POLYBROMINATED DIPHENYL ETHERS (PBDEs)	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN ANNEX A, BY SOLVENT EXTRACTION AND DETERMINED BY GC-MSD AND FURTHER HPLC CONFIRMATION WHEN NECESSARY.	5 ppm

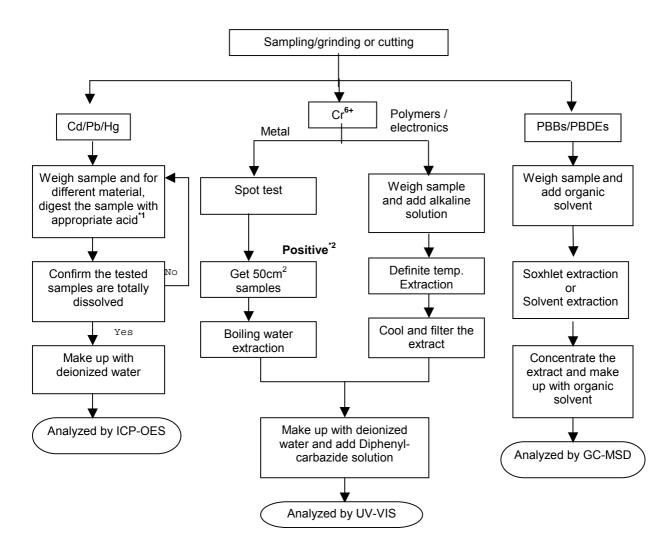
REMARK: REPORTING LIMIT = QUANTITATION LIMIT OF ANALYZE IN SAMPLE



TESTS CONDUCTED

(IV) MEASUREMENT FLOWCHART:

TEST FOR Cd/ Pb/ Hg/Cr (VI)/ PBBS/PBDES CONTENTS REFERENCE STANDARD: IEC 62321 EDITION 1.0:2008



REMARKS:

*1: LIST OF APPROPRIATE ACID:

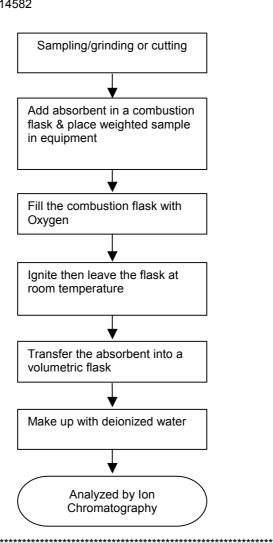
MATERIAL	ACID ADDED FOR DIGESTION
POLYMERS HNO	_{3,} HCL,HF,H ₂ O _{2,} H ₃ BO ₃
METALS HNO	_{3,} HCL,HF
ELECTRONICS HNO	3,HCL,H ₂ O ₂ ,HBF ₄

*2: IF THE RESULT OF SPOT TEST IS POSITIVE, CHROMIUM (VI) WOULD BE DETERMINED AS DETECTED.



TEST REPORT

TESTS CONDUCTED (\boldsymbol{V}) MEASUREMENT FLOWCHART: TEST FOR HALOGEN CONTENT REFERENCE STANDARD: EN 14582



NUMBER: SH

AH00355836



TESTS CONDUCTED

2 (I) Test Result Summary:

	Testing Item	Result (ppm)
Halogen Content		
Fluorine (F)		ND
Chlorine (CI)		100
Bromine (Br)		ND
lodine (I)		ND

ppm = Parts per million = mg/kg Remarks:

Not detected

Responsibility Of Chemist : Grace Wang

(III) Test Method:

Testing Item T	esting Method R	eporting Limit
inalonen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by ion chromatography	50 ppm

Remark: Reporting limit = Quantitation limit of analyte in sample

Date Sample Received : Dec.5, 2012

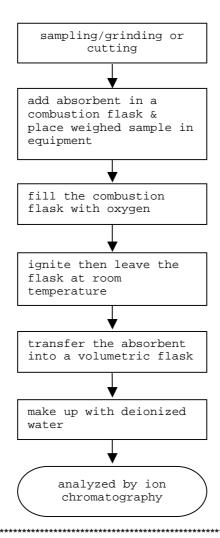
Testing Period : Dec.5, 2012 To Dec.11, 2012



TEST REPORT

TESTS CONDUCTED ($\!\operatorname{IV}\!$) Measurement Flowchart:

> Test For Halogen Content Reference Standard: EN 14582



NUMBER: SH

AH00355836



TEST REPORT

NUMBER: SH AH00355836

TESTS CONDUCTED



END OF REPORT

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Joy Zhou

Test Report Number: 131000457SHA-007

Applicant:	LITTELFUSE, INC. 800 E. NORTHWEST I DES PLAINES, IL 600 ATTN: J. CABILAN / A	16		Date	: Oct. 29, 2013
Sample Description One (1) s Part Description Part Num	ubmitted sample said to be cription	: INK	(- RED 901	******	******
Tests conducted: As reque	sted by the applicant, for	details refer to	attached page(s).	*******	*******
Conclusion: Tested sample Submitted sampl	e *********			C 62321 Edition 1.0: 2008 uoted from RoHS Directive	<u>Result</u> Pass
					To be continued
Prepared and che For Intertek Testi	eck by: ng Services Ltd., Shangh	ai	Authorized by: For Intertek testing s	ervices Ltd., Shanghai	

Jonny Jing Manager



Tests Conducted

RoHS testing and Halogen content

(I) Test Result Summary:

Testing Item	Result (ppm)
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr ⁶⁺) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND
Halogen Content	
Fluorine (F)	ND
Chlorine (CI)	850
Bromine (Br)	ND
lodine (I)	ND

Remarks: ppm = parts per million = mg/kg

ND = not detected

Responsibility of Chemist: Dent Fang / Leaf Liu



Tests Conducted

(II) RoHS Requirement:

Restricted Substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(III) Test Method:

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr ⁶⁺) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by Ion Chromatography	50 ppm

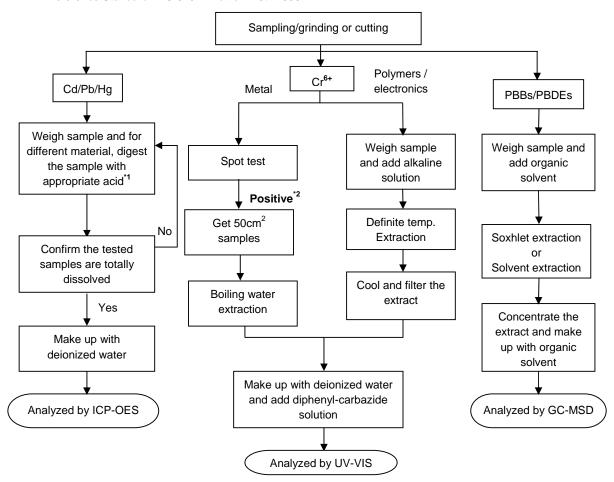
Remark: Reporting limit = Quantitation Limit of Analyze in Sample



Tests Conducted

(IV) Measurement Flowchart:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs Contents Reference Standard: IEC 62321 Edition 1.0: 2008



Remarks:

*1: List of appropriate acid:

MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO ₃ ,HCI,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO _{3,} HCL,HF
Electronics	HNO _{3,} HCL,H ₂ O _{2,} HBF ₄

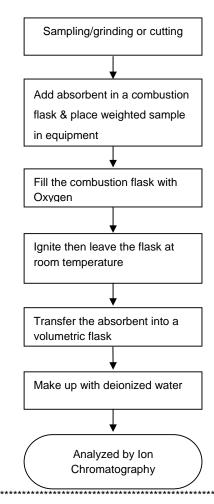
*2: If the result of spot test is positive, Chromium (VI) would be determined as detected.



Tests Conducted

(V) Measurement flowchart:

Test or Halogen content Reference standard: EN 14582





Tests Conducted

2. Phthalate content test

With reference to EN 14372 by Gas Chromatography-Mass Spectrometry (GC-MS) analysis.

Tested Compound	Result (%,w/w)	Client' requirement (%, w/w)
Di-butyl phthalate (DBP)	ND	-
Di(2-ethyl hexyl) phthalate(DEHP)	ND	-
Benzyl butyl phthalate (BBP)	ND	-
Sum of three phthalates	ND	0.1
Di-iso-butyl phthalate (DIBP)	ND	0.1

Remark : Detection Limit = 0.01%(w/w)

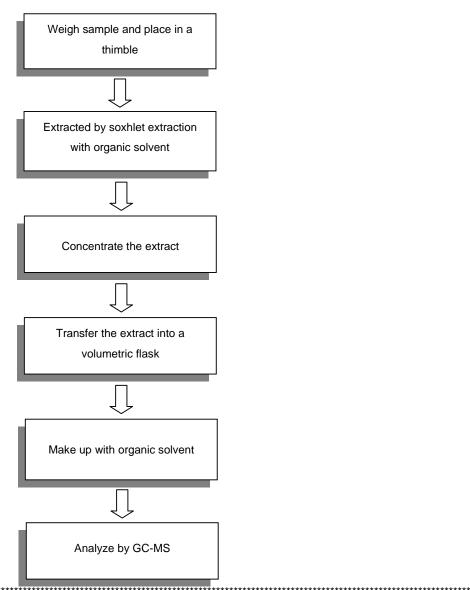
ND = Not Detected



Tests Conducted

Measurement flowchart:

Test for **phthalate** content





Tests Conducted

3. HBCDD content

(I)Test result summary:

Testing item	Result (ppm)
HBCDD (hexabromocyclododecane)	ND

Remarks: ppm = parts per million = mg/kg

ND = Not detected

(II) Test method:

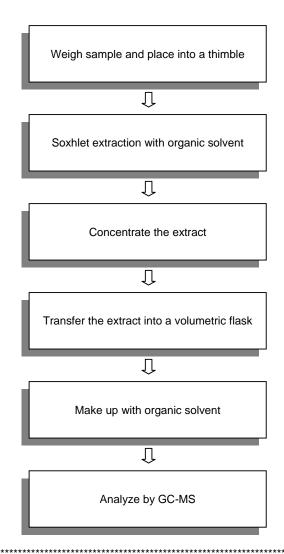
Testing item		Testing method	Reporting limit
HBCDD (hexabrom	locyclododecane)	With reference to US EPA 3540C, by solvent extraction and determined by GC-MS	10 ppm



Tests Conducted

Measurement flowchart:

Test for HBCDD (hexabromocyclododecane) content





Tests Conducted

4. Total Antimony (Sb) Content

As per client's request, acid digestion method was used and total Antimony content was determined by Inductively Coupled Argon Plasma Spectrometry.

Result: <10ppm

Remark: ppm = parts per million = mg/kg

Date sample received: Oct. 16, 2013

Testing period: Oct. 16, 2013 To Oct. 29, 2013



Tests Conducted



Picture was provided by applicant

End of report

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Joy Zhou

Test Report Number: 131000457SHA-001

Applicant:	LITTELFUSE, INC. 800 E. NORTHWEST I DES PLAINES, IL 600 ATTN: J. CABILAN / A	16		Date:	Oct. 29, 2013
Sample Description One (1) s Part Desc Part Num	ubmitted sample said to be cription	: INK	- BLACK 902	*******	*******
Tests conducted: As reques	sted by the applicant, for	details refer to	attached page(s).	******	*******
Conclusion: Tested sample Submitted sample	Э	and maximum 2011/65/EU	e to test method of IEC 62321 n concentration limits quoted fro	om RoHS Directive	Result Pass
*******	**********	******	*************************	**********	To be continued
Prepared and che For Intertek Testi	eck by: ng Services Ltd., Shangh	ai	Authorized by: For Intertek testing services l	_td., Shanghai	

Jonny Jing Manager



Tests Conducted

RoHS testing and Halogen content

(I) Test Result Summary:

Testing Item	Result (ppm)
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr ⁶⁺) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND
Halogen Content	
Fluorine (F)	ND
Chlorine (CI)	100
Bromine (Br)	ND
lodine (I)	ND

Remarks: ppm = parts per million = mg/kg

ND = not detected

Responsibility of Chemist: Dent Fang / Leaf Liu



Tests Conducted

(II) RoHS Requirement:

Restricted Substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(III) Test Method:

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr ⁶⁺) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by Ion Chromatography	50 ppm

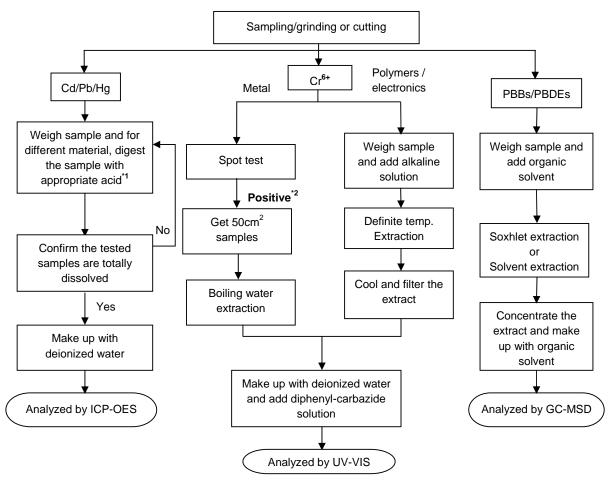
Remark: Reporting limit = Quantitation Limit of Analyze in Sample



Tests Conducted

(IV) Measurement Flowchart:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs Contents Reference Standard: IEC 62321 Edition 1.0: 2008



Remarks:

*1: List of appropriate acid:

MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO ₃ ,HCl,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO _{3,} HCL,HF
Electronics	HNO ₃ ,HCL,H ₂ O ₂ ,HBF ₄

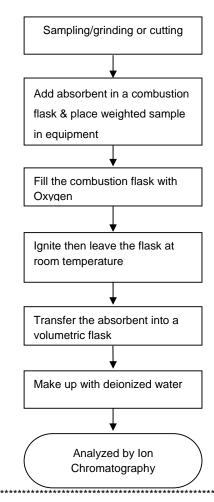
*2: If the result of spot test is positive, Chromium (VI) would be determined as detected.



Tests Conducted

(V) Measurement flowchart:

Test or Halogen content Reference standard: EN 14582





Tests Conducted

2. Phthalate content test

With reference to EN 14372 by Gas Chromatography-Mass Spectrometry (GC-MS) analysis.

Tested Compound	Result (%,w/w)	Client' requirement (%, w/w)
Di-butyl phthalate (DBP)	ND	-
Di(2-ethyl hexyl) phthalate(DEHP)	ND	-
Benzyl butyl phthalate (BBP)	ND	-
Sum of three phthalates	ND	0.1
Di-iso-butyl phthalate (DIBP)	ND	0.1

Remark : Detection Limit = 0.01%(w/w)

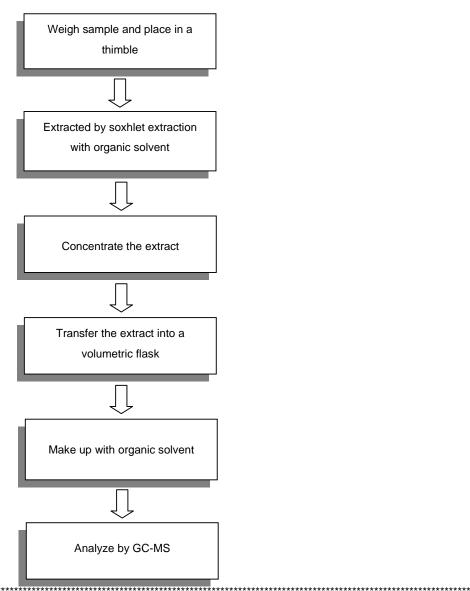
ND = Not Detected



Tests Conducted

Measurement flowchart:

Test for **phthalate** content





Tests Conducted

3. HBCDD content

(I)Test result summary:

Testing item	Result (ppm)
HBCDD (hexabromocyclododecane)	ND

Remarks: ppm = parts per million = mg/kg

ND = Not detected

(II) Test method:

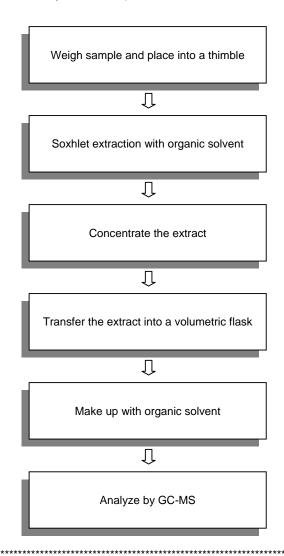
Testing item		Testing method	Reporting limit
HBCDD (hexabrom	locyclododecane)	With reference to US EPA 3540C, by solvent extraction and determined by GC-MS	10 ppm



Tests Conducted

Measurement flowchart:

Test for HBCDD (hexabromocyclododecane) content





Tests Conducted

4. Total Antimony (Sb) Content

As per client's request, acid digestion method was used and total Antimony content was determined by Inductively Coupled Argon Plasma Spectrometry.

Result: <10ppm

Remark: ppm = parts per million = mg/kg

Date sample received: Oct. 16, 2013

Testing period: Oct. 16, 2013 To Oct. 29, 2013



Tests Conducted



Picture was provided by applicant

End of report

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Joy Zhou

Test Report Number: 131000457SHA-002

800 DE	TELFUSE, INC. DE. NORTHWEST HWY S PLAINES, IL 60016 TN: J. CABILAN / A. CESIS		e: Oct. 29, 2013
Sample Description: One (1) submi Part Description Part Number	tted sample said to be: Blu e on	e ink : INK - BLUE : 425904	*******
Tests conducted: As requested by	by the applicant, for details	refer to attached page(s).	*******
Conclusion: Tested sample Submitted sample		eference to test method of IEC 62321 Edition 1.0: 2008 aximum concentration limits quoted from RoHS Directive 65/EU	Result Pass
********	*********	***************************************	To be continued
Prepared and check b For Intertek Testing So	y: ervices Ltd., Shanghai	Authorized by: For Intertek testing services Ltd., Shanghai	

Jonny Jing Manager



Tests Conducted

RoHS testing and Halogen content

(I) Test Result Summary:

<u>Testing Item</u>	Result (ppm)
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr ⁶⁺) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND
Halogen Content	
Fluorine (F)	ND
Chlorine (CI)	300
Bromine (Br)	ND
lodine (I)	ND

Remarks: ppm = parts per million = mg/kg

ND = not detected

Responsibility of Chemist: Dent Fang / Leaf Liu



Tests Conducted

(II) RoHS Requirement:

Restricted Substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(III) Test Method:

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr ⁶⁺) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by Ion Chromatography	50 ppm

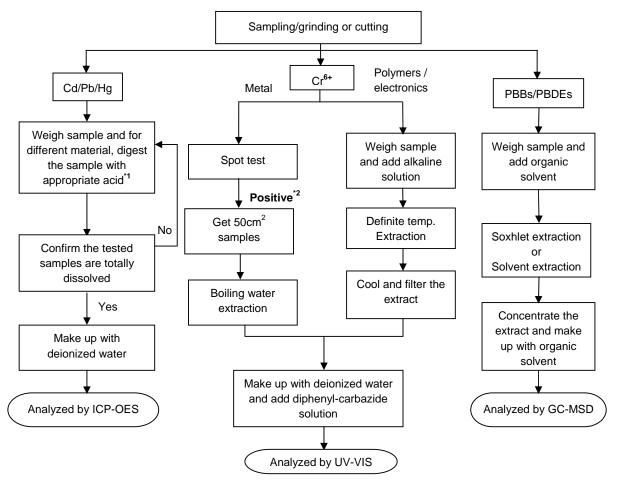
Remark: Reporting limit = Quantitation Limit of Analyze in Sample



Tests Conducted

(IV) Measurement Flowchart:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs Contents Reference Standard: IEC 62321 Edition 1.0: 2008



Remarks:

*1: List of appropriate acid:

MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO ₃ ,HCI,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO _{3,} HCL,HF
Electronics	HNO _{3,} HCL,H ₂ O _{2,} HBF ₄

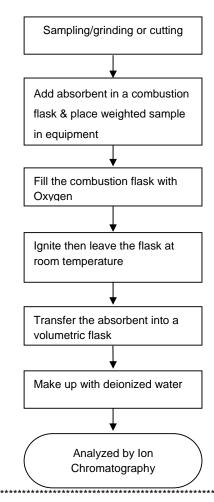
*2: If the result of spot test is positive, Chromium (VI) would be determined as detected.



Tests Conducted

(V) Measurement flowchart:

Test or Halogen content Reference standard: EN 14582





Tests Conducted

2. Phthalate content test

With reference to EN 14372 by Gas Chromatography-Mass Spectrometry (GC-MS) analysis.

Tested Compound	Result (%,w/w)	Client' requirement (%, w/w)
Di-butyl phthalate (DBP)	ND	-
Di(2-ethyl hexyl) phthalate(DEHP)	ND	-
Benzyl butyl phthalate (BBP)	ND	-
Sum of three phthalates	ND	0.1
Di-iso-butyl phthalate (DIBP)	ND	0.1

Remark : Detection Limit = 0.01%(w/w)

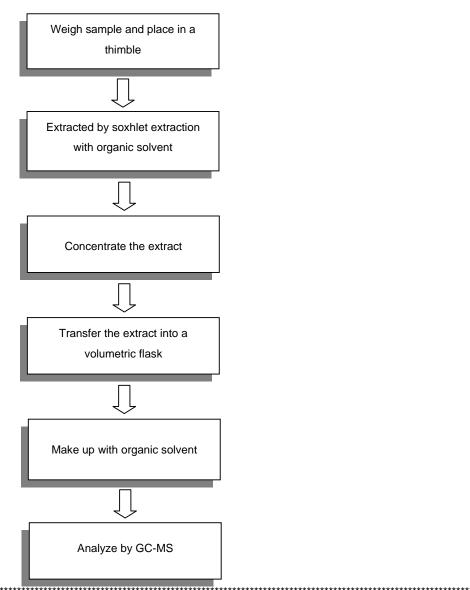
ND = Not Detected



Tests Conducted

Measurement flowchart:

Test for **phthalate** content





Tests Conducted

3. HBCDD content

(I)Test result summary:

Testing item	Result (ppm)
HBCDD (hexabromocyclododecane)	ND

Remarks: ppm = parts per million = mg/kg

ND = Not detected

(II) Test method:

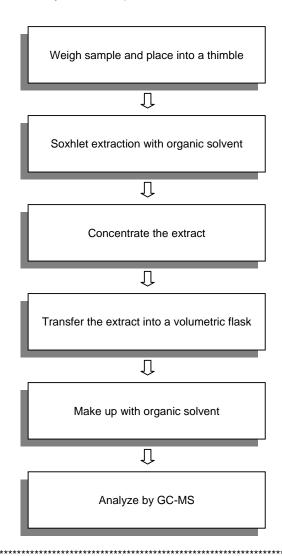
Testing item		Testing method	Reporting limit
HBCDD (hexabrom	locyclododecane)	With reference to US EPA 3540C, by solvent extraction and determined by GC-MS	10 ppm
······································			



Tests Conducted

Measurement flowchart:

Test for HBCDD (hexabromocyclododecane) content





Tests Conducted

4. Total Antimony (Sb) Content

As per client's request, acid digestion method was used and total Antimony content was determined by Inductively Coupled Argon Plasma Spectrometry.

Result: <10ppm

Remark: ppm = parts per million = mg/kg

Date sample received: Oct. 16, 2013

Testing period: Oct. 16, 2013 To Oct. 29, 2013



Tests Conducted



Picture was provided by applicant

End of report

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Joy Zhou

Test Report Number: 131000457SHA-006

Applicant:	LITTELFUSE, INC. 800 E. NORTHWEST I DES PLAINES, IL 600 ATTN: J. CABILAN / A	16		Da	ate: Oct. 29, 2013
Sample Descriptio One (1) s Part Desc Part Num	ubmitted sample said to be cription	: INK	(- ORANGE 900	**********	********
Tests conducted: As reques	sted by the applicant, for	details refer to	attached page(s).	**********	********
Conclusion: Tested sample Submitted sample	e **********			EC 62321 Edition 1.0: 2008 quoted from RoHS Directiv	
					To be continued
Prepared and che For Intertek Testi	eck by: ng Services Ltd., Shangh	ai	Authorized by: For Intertek testing	services Ltd., Shanghai	

Jonny Jing Manager



Tests Conducted

RoHS testing and Halogen content

(I) Test Result Summary:

<u>Testing Item</u>	Result (ppm)
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr ⁶⁺) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND
Halogen Content	
Fluorine (F)	ND
Chlorine (CI)	63900
Bromine (Br)	ND
lodine (I)	ND

Remarks: ppm = parts per million = mg/kg

ND = not detected

Responsibility of Chemist: Dent Fang / Leaf Liu



Tests Conducted

(II) RoHS Requirement:

Restricted Substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(III) Test Method:

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr ⁶⁺) content	hromium VI (Cr ⁶⁺) content With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by Ion Chromatography	50 ppm

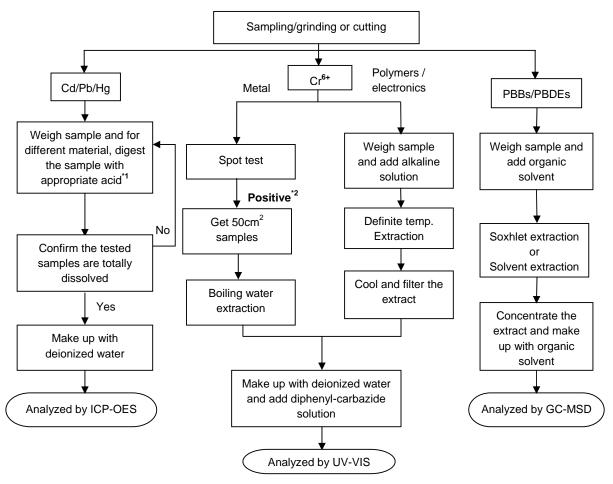
Remark: Reporting limit = Quantitation Limit of Analyze in Sample



Tests Conducted

(IV) Measurement Flowchart:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs Contents Reference Standard: IEC 62321 Edition 1.0: 2008



Remarks:

*1: List of appropriate acid:

MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO ₃ ,HCI,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO _{3,} HCL,HF
Electronics	HNO _{3,} HCL,H ₂ O _{2,} HBF ₄

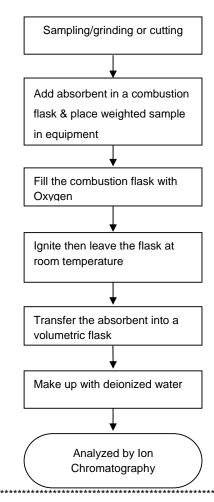
*2: If the result of spot test is positive, Chromium (VI) would be determined as detected.



Tests Conducted

(V) Measurement flowchart:

Test or Halogen content Reference standard: EN 14582





Tests Conducted

2. Phthalate content test

With reference to EN 14372 by Gas Chromatography-Mass Spectrometry (GC-MS) analysis.

Tested Compound	Result (%,w/w)	Client' requirement (%, w/w)
Di-butyl phthalate (DBP)	ND	-
Di(2-ethyl hexyl) phthalate(DEHP)	ND	-
Benzyl butyl phthalate (BBP)	ND	-
Sum of three phthalates	ND	0.1
Di-iso-butyl phthalate (DIBP)	ND	0.1

Remark : Detection Limit = 0.01%(w/w)

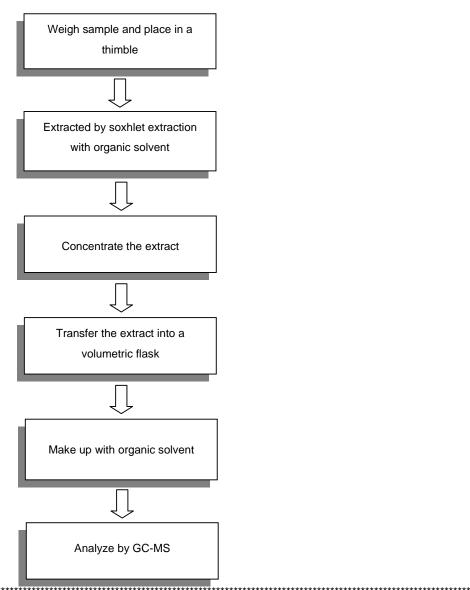
ND = Not Detected



Tests Conducted

Measurement flowchart:

Test for **phthalate** content





Tests Conducted

3. HBCDD content

(I)Test result summary:

Testing item	Result (ppm)
HBCDD (hexabromocyclododecane)	ND

Remarks: ppm = parts per million = mg/kg

ND = Not detected

(II) Test method:

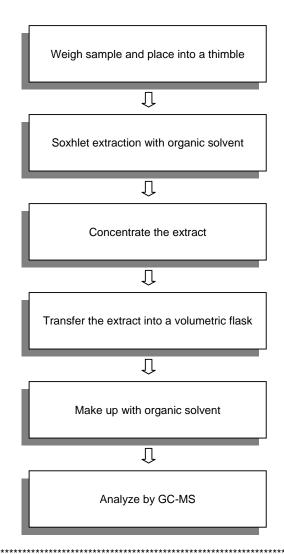
Testing item		Testing method	Reporting limit
HBCDD (hexabrom	locyclododecane)	With reference to US EPA 3540C, by solvent extraction and determined by GC-MS	10 ppm
······································			



Tests Conducted

Measurement flowchart:

Test for HBCDD (hexabromocyclododecane) content





Tests Conducted

4. Total Antimony (Sb) Content

As per client's request, acid digestion method was used and total Antimony content was determined by Inductively Coupled Argon Plasma Spectrometry.

Result: <10ppm

Remark: ppm = parts per million = mg/kg

Date sample received: Oct. 16, 2013

Testing period: Oct. 16, 2013 To Oct. 29, 2013



Tests Conducted



Picture was provided by applicant

End of report

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Applicant:	LITTELFUSE, INC. 800 E. NORTHWEST H DES PLAINES, IL 600 ATTN: J. CABILAN / A	16	ΓA JR	Date:	Oct. 29, 2013
Sample Description One (1) so Part Description Part Num	ubmitted sample said to b cription ber	:	w ink INK - YELLOW 425903	******	*******
Tests conducted:		-1-4-11	for to all other description		
As reques	sted by the applicant, for o	details re	erer to attached page(s).	******	******
Conclusion: Tested sample Submitted sample)		 ference to test method of IEC 62321 Edition ximum concentration limits quoted from Rol		Result Pass
***********	******************	******	*****************	*******	To be continued

Prepared and check by: For Intertek Testing Services Ltd., Shanghai Authorized by: For Intertek testing services Ltd., Shanghai Joy Zhou Jonny Jing Manager



Tests Conducted

RoHS testing and Halogen content

(I) Test Result Summary:

Testing Item	Result (ppm)			
Heavy Metal				
Cadmium (Cd) content	ND			
Lead (Pb) content	ND			
Mercury (Hg) content	ND			
Chromium VI (Cr ⁶⁺) content	ND			
Polybrominated Biphenyls (PBBs)				
Monobrominated Biphenyls (MonoBB)	ND			
Dibrominated Biphenyls (DiBB)	ND			
Tribrominated Biphenyls (TriBB)	ND			
Tetrabrominated Biphenyls (TetraBB)	ND			
Pentabrominated Biphenyls (PentaBB)	ND			
Hexabrominated Biphenyls (HexaBB)	ND			
Heptabrominated Biphenyls (HeptaBB)	ND			
Octabrominated Biphenyls (OctaBB)	ND			
Nonabrominated Biphenyls (NonaBB)	ND			
Decabrominated Biphenyl (DecaBB)	ND			
Polybrominated Diphenyl Ethers (PBDEs)				
Monobrominated Diphenyl Ethers (MonoBDE)	ND			
Dibrominated Diphenyl Ethers (DiBDE)	ND			
Tribrominated Diphenyl Ethers (TriBDE)	ND			
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND			
Pentabrominated Diphenyl Ethers (PentaBDE)	ND			
Hexabrominated Diphenyl Ethers (HexaBDE)	ND			
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND			
Octabrominated Diphenyl Ethers (OctaBDE)	ND			
Nonabrominated Diphenyl Ethers (NonaBDE)	ND			
Decabrominated Diphenyl Ether (DecaBDE)	ND			
Halogen Content				
Fluorine (F)	ND			
Chlorine (CI)	7050			
Bromine (Br)	ND			
lodine (I)	ND			

Remarks: ppm = parts per million = mg/kg

ND = not detected

Responsibility of Chemist: Dent Fang / Leaf Liu



Tests Conducted

(II) RoHS Requirement:

Restricted Substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(III) Test Method:

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr ⁶⁺) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by Ion Chromatography	50 ppm

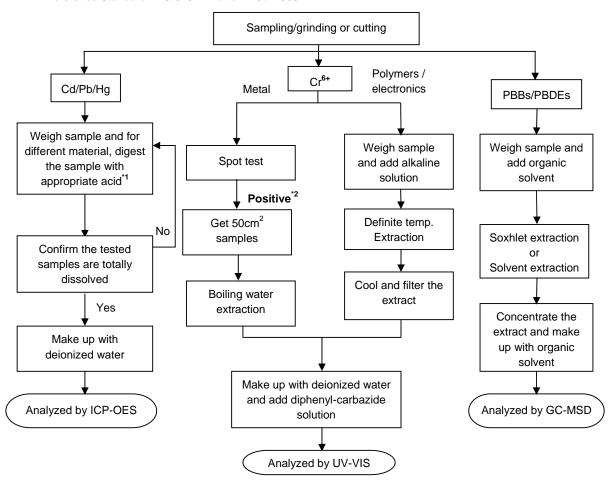
Remark: Reporting limit = Quantitation Limit of Analyze in Sample



Tests Conducted

(IV) Measurement Flowchart:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs Contents Reference Standard: IEC 62321 Edition 1.0: 2008



Remarks:

*1: List of appropriate acid:

-11 -1	
MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO ₃ ,HCl,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO ₃ ,HCL,HF
Electronics	HNO ₃ ,HCL,H ₂ O ₂ ,HBF ₄

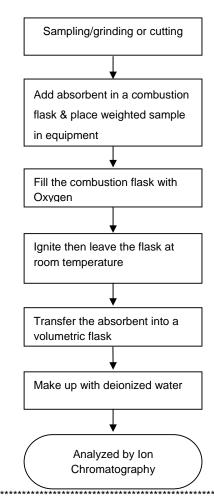
*2: If the result of spot test is positive, Chromium (VI) would be determined as detected.



Tests Conducted

(V) Measurement flowchart:

Test or Halogen content Reference standard: EN 14582





Tests Conducted

2. Phthalate content test

With reference to EN 14372 by Gas Chromatography-Mass Spectrometry (GC-MS) analysis.

Tested Compound	Result (%,w/w)	Client' requirement (%, w/w)
Di-butyl phthalate (DBP)	ND	-
Di(2-ethyl hexyl) phthalate(DEHP)	ND	-
Benzyl butyl phthalate (BBP)	ND	-
Sum of three phthalates	ND	0.1
Di-iso-butyl phthalate (DIBP)	ND	0.1

Remark : Detection Limit = 0.01%(w/w)

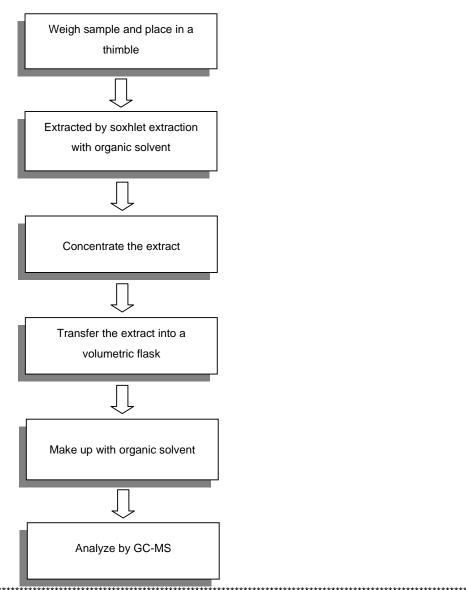
ND = Not Detected



Tests Conducted

Measurement flowchart:

Test for **phthalate** content





Tests Conducted

3. HBCDD content

(I)Test result summary:

Testing item	Result (ppm)
HBCDD (hexabromocyclododecane)	ND

Remarks: ppm = parts per million = mg/kg

ND = Not detected

(${\rm II}$) Test method:

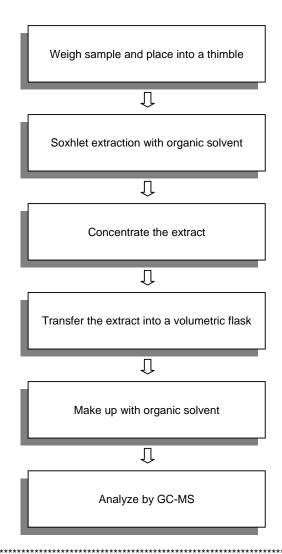
Testing item		Testing method	Reporting limit
	HBCDD (hexabromocyclododecane)	With reference to US EPA 3540C, by solvent extraction and determined by GC-MS	10 ppm



Tests Conducted

Measurement flowchart:

Test for HBCDD (hexabromocyclododecane) content





Tests Conducted

4. Total Antimony (Sb) Content

As per client's request, acid digestion method was used and total Antimony content was determined by Inductively Coupled Argon Plasma Spectrometry.

Result: <10ppm

Remark: ppm = parts per million = mg/kg

Date sample received: Oct. 16, 2013

Testing period: Oct. 16, 2013 To Oct. 29, 2013



Tests Conducted



Picture was provided by applicant

End of report

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Joy Zhou

Test Report Number: 131000457SHA-004

Applicant:	LITTELFUSE, INC. 800 E. NORTHWEST I DES PLAINES, IL 600 ATTN: J. CABILAN / A	16		Date	Oct. 29, 2013
Sample Descriptio One (1) s Part Desc Part Num	submitted sample said to be cription	: INK	(- GREEN 1907	*******	******
Tests conducted: As reque	sted by the applicant, for	details refer to	attached page(s).	*******	*******
Conclusion: <u>Tested sample</u> Submitted sampl		and maximur 2011/65/EU	ee to test method of IEC 62 n concentration limits quote	ed from RoHS Directive	Result Pass
***********	*********	******	***********	**********	To be continued
Prepared and che For Intertek Testi	eck by: ing Services Ltd., Shangh	ai	Authorized by: For Intertek testing service	ces Ltd., Shanghai	

Jonny Jing Manager



Tests Conducted

RoHS testing and Halogen content

(I) Test Result Summary:

Testing Item	Result (ppm)			
Heavy Metal				
Cadmium (Cd) content	ND			
Lead (Pb) content	ND			
Mercury (Hg) content	ND			
Chromium VI (Cr ⁶⁺) content	ND			
Polybrominated Biphenyls (PBBs)				
Monobrominated Biphenyls (MonoBB)	ND			
Dibrominated Biphenyls (DiBB)	ND			
Tribrominated Biphenyls (TriBB)	ND			
Tetrabrominated Biphenyls (TetraBB)	ND			
Pentabrominated Biphenyls (PentaBB)	ND			
Hexabrominated Biphenyls (HexaBB)	ND			
Heptabrominated Biphenyls (HeptaBB)	ND			
Octabrominated Biphenyls (OctaBB)	ND			
Nonabrominated Biphenyls (NonaBB)	ND			
Decabrominated Biphenyl (DecaBB)	ND			
Polybrominated Diphenyl Ethers (PBDEs)	·			
Monobrominated Diphenyl Ethers (MonoBDE)	ND			
Dibrominated Diphenyl Ethers (DiBDE)	ND			
Tribrominated Diphenyl Ethers (TriBDE)	ND			
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND			
Pentabrominated Diphenyl Ethers (PentaBDE)	ND			
Hexabrominated Diphenyl Ethers (HexaBDE)	ND			
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND			
Octabrominated Diphenyl Ethers (OctaBDE)	ND			
Nonabrominated Diphenyl Ethers (NonaBDE)	ND			
Decabrominated Diphenyl Ether (DecaBDE)	ND			
Halogen Content				
Fluorine (F)	ND			
Chlorine (CI)	700			
Bromine (Br)	ND			
lodine (I)	ND			

Remarks: ppm = parts per million = mg/kg

ND = not detected

Responsibility of Chemist: Dent Fang / Leaf Liu



Tests Conducted

(II) RoHS Requirement:

Restricted Substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(III) Test Method:

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr ⁶⁺) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by Ion Chromatography	50 ppm

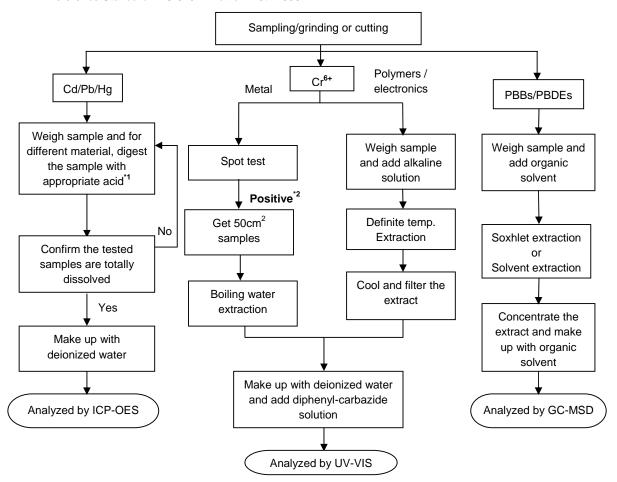
Remark: Reporting limit = Quantitation Limit of Analyze in Sample



Tests Conducted

(IV) Measurement Flowchart:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs Contents Reference Standard: IEC 62321 Edition 1.0: 2008



Remarks:

*1: List of appropriate acid:

MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO ₃ ,HCI,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO _{3,} HCL,HF
Electronics	HNO _{3,} HCL,H ₂ O _{2,} HBF ₄

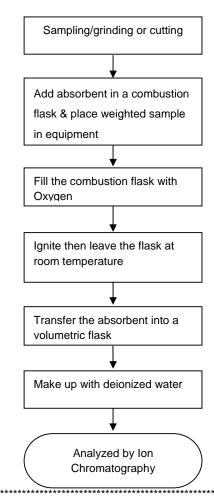
*2: If the result of spot test is positive, Chromium (VI) would be determined as detected.



Tests Conducted

(V) Measurement flowchart:

Test or Halogen content Reference standard: EN 14582





Tests Conducted

2. Phthalate content test

With reference to EN 14372 by Gas Chromatography-Mass Spectrometry (GC-MS) analysis.

Tested Compound	Result (%,w/w)	Client' requirement (%, w/w)
Di-butyl phthalate (DBP)	ND	-
Di(2-ethyl hexyl) phthalate(DEHP)	ND	-
Benzyl butyl phthalate (BBP)	ND	-
Sum of three phthalates	ND	0.1
Di-iso-butyl phthalate (DIBP)	ND	0.1

Remark : Detection Limit = 0.01%(w/w)

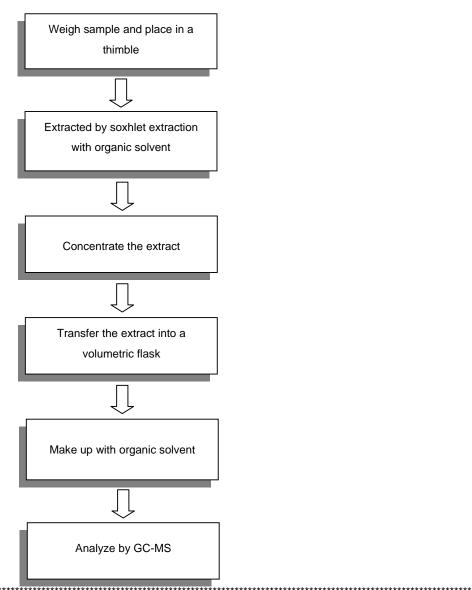
ND = Not Detected



Tests Conducted

Measurement flowchart:

Test for **phthalate** content





Tests Conducted

3. HBCDD content

(I)Test result summary:

Testing item	Result (ppm)
HBCDD (hexabromocyclododecane)	ND

Remarks: ppm = parts per million = mg/kg

ND = Not detected

(${\rm II}$) Test method:

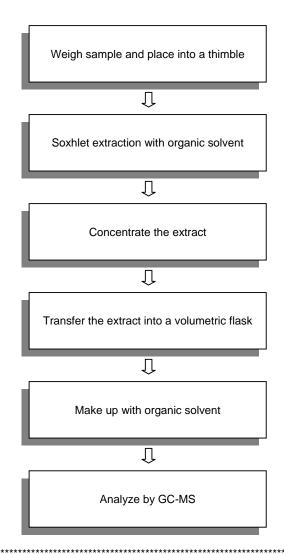
Testing item		Testing method	Reporting limit
	HBCDD (hexabromocyclododecane)	With reference to US EPA 3540C, by solvent extraction and determined by GC-MS	10 ppm



Tests Conducted

Measurement flowchart:

Test for HBCDD (hexabromocyclododecane) content





Tests Conducted

4. Total Antimony (Sb) Content

As per client's request, acid digestion method was used and total Antimony content was determined by Inductively Coupled Argon Plasma Spectrometry.

Result: <10ppm

Remark: ppm = parts per million = mg/kg

Date sample received: Oct. 16, 2013

Testing period: Oct. 16, 2013 To Oct. 29, 2013



Tests Conducted



Picture was provided by applicant

End of report

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Joy Zhou

Test Report Number: 131000457SHA-008

Applicant:	LITTELFUSE, INC. 800 E. NORTHWEST I DES PLAINES, IL 600 ATTN: J. CABILAN / A	16		Date	e: Oct. 29, 2013
Sample Descriptio One (1) s Part Desc Part Num	ubmitted sample said to be cription	: INK	(- VIOLET 1911 *********************************	********	*******
Tests conducted: As reques	sted by the applicant, for	details refer to	attached page(s).	**********	*******
Conclusion: Tested sample Submitted sample	e **********			C 62321 Edition 1.0: 2008 quoted from RoHS Directive	Result Pass
					To be continued
Prepared and che For Intertek Testi	eck by: ng Services Ltd., Shangh	ai	Authorized by: For Intertek testing s	services Ltd., Shanghai	

Jonny Jing Manager



Tests Conducted

RoHS testing and Halogen content

(I) Test Result Summary:

Testing Item	Result (ppm)
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr ⁶⁺) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND
Halogen Content	
Fluorine (F)	ND
Chlorine (CI)	7600
Bromine (Br)	ND
lodine (I)	ND

Remarks: ppm = parts per million = mg/kg

ND = not detected

Responsibility of Chemist: Dent Fang / Leaf Liu



Tests Conducted

(II) RoHS Requirement:

Restricted Substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(III) Test Method:

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr ⁶⁺) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by Ion Chromatography	50 ppm

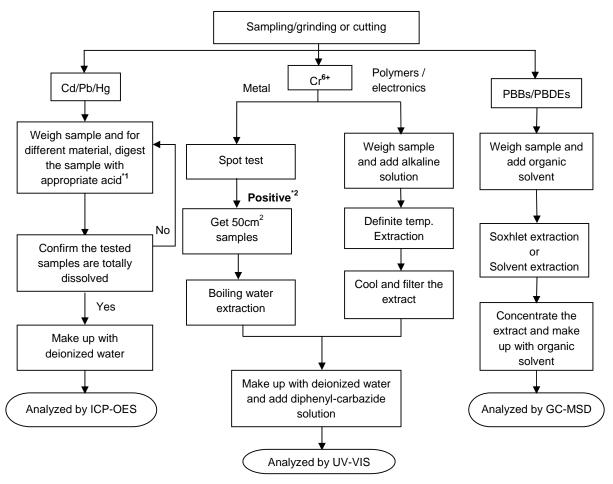
Remark: Reporting limit = Quantitation Limit of Analyze in Sample



Tests Conducted

(IV) Measurement Flowchart:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs Contents Reference Standard: IEC 62321 Edition 1.0: 2008



Remarks:

*1: List of appropriate acid:

erle le control account	
MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO ₃ ,HCl,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO _{3,} HCL,HF
Electronics	HNO _{3,} HCL,H ₂ O _{2,} HBF ₄

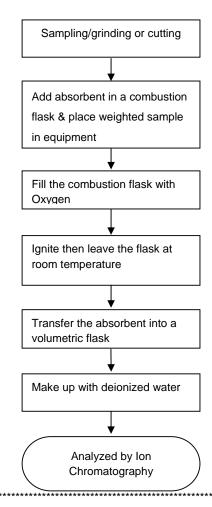
*2: If the result of spot test is positive, Chromium (VI) would be determined as detected.



Tests Conducted

(V) Measurement flowchart:

Test or Halogen content Reference standard: EN 14582





Tests Conducted

2. Phthalate content test

With reference to EN 14372 by Gas Chromatography-Mass Spectrometry (GC-MS) analysis.

Tested Compound	Result (%,w/w)	Client' requirement (%, w/w)
Di-butyl phthalate (DBP)	ND	-
Di(2-ethyl hexyl) phthalate(DEHP)	ND	-
Benzyl butyl phthalate (BBP)	ND	-
Sum of three phthalates	ND	0.1
Di-iso-butyl phthalate (DIBP)	ND	0.1

Remark : Detection Limit = 0.01%(w/w)

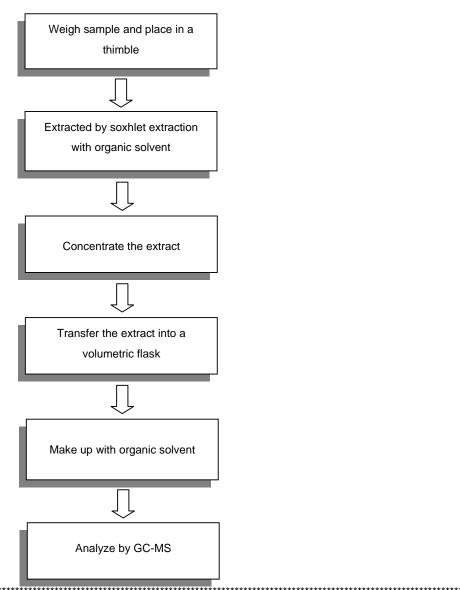
ND = Not Detected



Tests Conducted

Measurement flowchart:

Test for **phthalate** content





Tests Conducted

3. HBCDD content

(I)Test result summary:

Testing item	Result (ppm)
HBCDD (hexabromocyclododecane)	ND

Remarks: ppm = parts per million = mg/kg

ND = Not detected

(${\rm II}$) Test method:

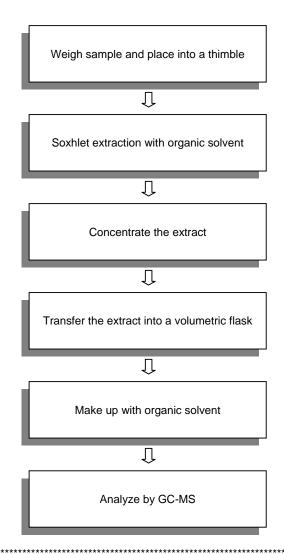
	Testing item	Testing method	Reporting limit	
	IHB(:I)I) (hexabromocyclododecane)	With reference to US EPA 3540C, by solvent extraction and determined by GC-MS	10 ppm	
*********	***************************************			



Tests Conducted

Measurement flowchart:

Test for HBCDD (hexabromocyclododecane) content





Tests Conducted

4. Total Antimony (Sb) Content

As per client's request, acid digestion method was used and total Antimony content was determined by Inductively Coupled Argon Plasma Spectrometry.

Result: <10ppm

Remark: ppm = parts per million = mg/kg

Date sample received: Oct. 16, 2013

Testing period: Oct. 16, 2013 To Oct. 29, 2013



Tests Conducted



Picture was provided by applicant

End of report

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NO.: A002R130403070-2R02 Date: Apr.08, 2013 Page 1 of 4

Customer: SuZhou FuHong Electronic Industrial Co., Ltd.

Address: NO. 89 WEI DU ROAD, WANGTING TOWN, XIANGCHENG DISTRICT, SUZHOU, CHINA

Report on the submitted sample said to be

Sample name: Lead wire copper shell

Model: /

Item/Lot No.: /

Material: /
Buyer: /
Supplier: /

Manufacturer: /

Sample received date: Apr.03, 2013

Testing period: From Apr.03, 2013 to Apr.08, 2013

Testing Requested

As specified by client, to determine the Lead, Cadmium, Mercury & Hexavalent Chromium content in the submitted sample in accordance with Directive 2011/65/EU (RoHS).

Testing method:

Testing Item	Pretreatment method	Measuring instrument	MQL
Lead (Pb)	IEC 62321: 2008, section 9	ICP-OES	2mg/kg
Cadmium (Cd)	IEC 62321: 2008, section 9	ICP-OES	2 mg/kg
Mercury (Hg)	IEC 62321: 2008, section 7	ICP-OES	2 mg/kg
Chromium (Cr VI)	IEC 62321: 2008, Annex B	UV-VIS	0.02mg/kg*

Note:

Conclusion:

When tested as specified, the submitted sample complied with the requirements of Directive 2011/65/EU (RoHS).

******FOR FURTHER DETAILS, PLEASE REFER TO THE FOLLOWING PAGE(S)******

Signed for and on behalf of Shenzhen AOV Testing Technology Co., Ltd, Kunshan Branch

Project Leader:

Li Tingting, Maggie

Chemical Test Director

Reviewed by Weikin

Wang Wexin, Weikin

Technical Director

Approved by:

Yuan Qi, Mickey

Lab Manager



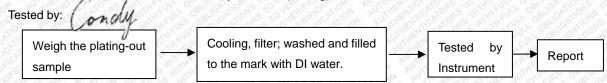
^{-* 0.02} mg/kg refers to the MQL of sample extraction liquid.



NO.: A002R130403070-2R02 Date: Apr.08, 2013 Page 2 of 4

Test Flow: 1. To Determine Lead, Cadmium Content: (Metal substrate) Tested by: onoul Add the digestion solution; the Weigh the sample into Add H₂O₂ until the sample is clear vessel is heated until the sample a vessel. has been dissolved Cooling the vessel, filter; washed and Tested by ICP-OES Report filled to the mark with distilled water. 2. To Determine Mercury Content: (Metal substrate) Tested by: onoul The sample is digested in the Weigh the sample Add the digestion solution, close microwave oven following a specific into a vessel. the microwave vessel. decomposition program. Cooling the vessel, filter; washed and Tested by ICP-OES Report filled to the mark with distilled water. 3. To Determine Hexavalent Chromium Content (boiling- water- extraction): (Metal substrate) Tested by: Remove the sample, and cool Take the (50±5) cm² Heat 50 mL of DI water in the the beaker to room temperature, sample in the beaker. beaker to boiling for 10 min and do the color reaction Test the sample solution and the 0.02 Report mg/kg standard solution by UV-VIS.

4. To Determine Lead, Cadmium and Mercury Content: (Plating)



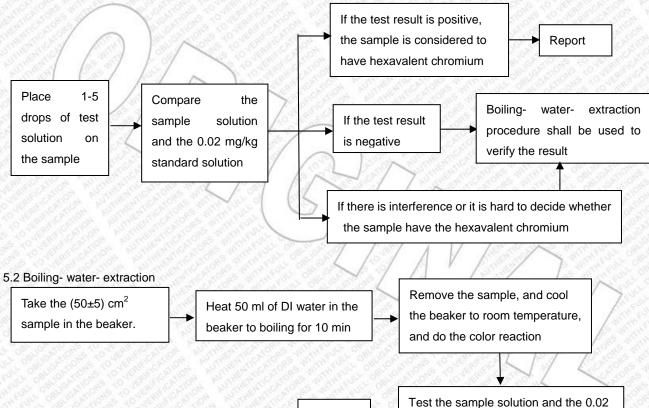




NO.: A002R130403070-2R02 Date: Apr.08, 2013 Page 3 of 4

5. To Determine Hexavalent Chromium Content in colorless and colored chromate coating on metals: (Plating)
Tested by:
5.1 Spot-test

If the test result is positive,



Report

mg/kg standard solution by UV-VIS.

Sample Description:

Code	Sample Description	Code	Sample Description
2-1	Lead wire substrate	2-3	Copper shell substrate
2-2	Lead wire Plating	2-4	Copper shell Plating

Test Results:

Item	Unit	RoHS Limit	-IS Limit Res		Result	
	HILLIAN COLL	ONLIGHTIONS T	2-1	2-2**	2-3	2-4**
Lead (Pb)	mg/kg	1000	N.D.	N.D.	N.D.	N.D.
Cadmium (Cd)	mg/kg	100	N.D.	N.D.	N.D.	N.D.
Mercury (Hg)	mg/kg	1000	N.D.	N.D.	N.D.	N.D.
Chromium (CrVI)	mg/kg	1000	Negative	Negative	Negative	Negative



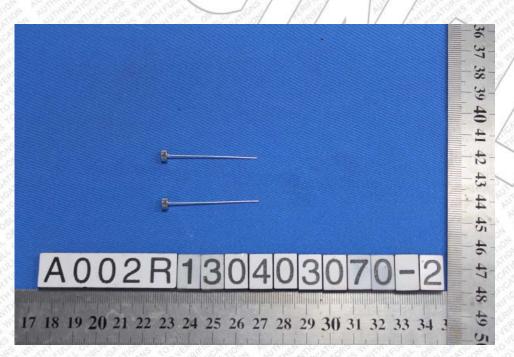


NO.: A002R130403070-2R02 Date: Apr.08, 2013 Page 4 of 4

Note:

- -Specimens, which requested to determine Lead, Cadmium and Mercury Content, have been dissolved completely.
- -N.D.=not detected(<MQL)
- -MQL=Method Quantitation Limit
- -Negative=Absence of Cr (VI);
- -Positive=Presence of Cr (VI);
- Uncertain= can not verify whether the sample have Hexavalent Chromium by spot-test.
- (The tested sample should be further verified by boiling-water-extraction method if the spot test result is uncertain or negative.)
- -**The test is based on the following assumption: The sample plating is a single layer and each part is uniform. The test result maybe cannot stand for the physical truth of sample plating.
- -Photo is included

Photograph of Sample



Lead wire copper shell

End of Report





TEST REPORT NUMBER: SH AH00355778

APPLICANT: LITTELFUSE,INC. DATE: DEC 10, 2012

800 E. NORTHWEST HWY ATT A.DIVIETRO/D.UNTIEDT

SAMPLE DESCRIPTION:

ONE(1) SUBMITTED SAMPLE SAID TO BE WHITE SAND. ITEM NAME SAND. PART NO. 091254.

TESTS CONDUCTED:

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

AUTHORIZED BY: FOR INTERTEK TESTING SERVICES LTD., SHANGHAI

JACOB LIN

GENERAL MANAGER



TESTS CONDUCTED

1 (I) TEST RESULT SUMMARY:

TESTING ITEM R	ESULT (ppm)
HEAVY METAL	
CADMIUM (Cd) CONTENT	ND
LEAD (Pb) CONTENT	ND
MERCURY (Hg) CONTENT	ND
CHROMIUM VI (Cr ⁶⁺) CONTENT	ND
POLYBROMINATED BIPHENYLS (PBBs)	
MONOBROMINATED BIPHENYLS (MonoBB)	ND
DIBROMINATED BIPHENYLS (DIBB)	ND
TRIBROMINATED BIPHENYLS (TriBB)	ND
TETRABROMINATED BIPHENYLS (TetraBB)	ND
PENTABROMINATED BIPHENYLS (PentaBB)	ND
HEXABROMINATED BIPHENYLS (HexaBB)	ND
HEPTABROMINATED BIPHENYLS (HeptaBB)	ND
OCTABROMINATED BIPHENYLS (OctaBB)	ND
NONABROMINATED BIPHENYLS (NonaBB)	ND
DECABROMINATED BIPHENYL (DecaBB)	ND
POLYBROMINATED DIPHENYL ETHERS (PBDEs)	
MONOBROMINATED DIPHENYL ETHERS (MonoBDE)	ND
DIBROMINATED DIPHENYL ETHERS (DIBDE)	ND
TRIBROMINATED DIPHENYL ETHERS (TriBDE)	ND
TETRABROMINATED DIPHENYL ETHERS (TetraBDE)	ND
PENTABROMINATED DIPHENYL ETHERS (PentaBDE)	ND
HEXABROMINATED DIPHENYL ETHERS (HexaBDE)	ND
HEPTABROMINATED DIPHENYL ETHERS (HeptaBDE)	ND
OCTABROMINATED DIPHENYL ETHERS (OctaBDE)	ND
NONABROMINATED DIPHENYL ETHERS (NonaBDE)	ND
DECABROMINATED DIPHENYL ETHER (DecaBDE)	ND
HALOGEN CONTENT	
FLUORINE (F)	ND
CHLORINE (CI)	ND
BROMINE (Br)	ND
IODINE (I)	ND

NUMBER: SH AH00355778

REMARKS: ppm = PARTS PER MILLION = mg/kg

ND = NOT DETECTED

RESPONSIBILITY OF CHEMIST: DENT FANG / LEAF LIU

(II) ROHS REQUIREMENT:

RESTRICTED SUBSTANCES LIM	ITS
CADMIUM (Cd) CONTENT	0.01% (100ppm)
LEAD (Pb) CONTENT	0.1% (1000ppm)
MERCURY (Hg) CONTENT	0.1% (1000ppm)
CHROMIUM VI (Cr ⁶⁺) CONTENT	0.1% (1000ppm)
POLYBROMINATED BIPHENYLS (PBBs)	0.1% (1000ppm)
POLYBROMINATED DIPHENYL ETHERS (PBDEs)	0.1% (1000ppm)

THE ABOVE LIMITS WERE QUOTED FROM ROHS DIRECTIVE 2002/95/EC AND AMENDMENT 2005/618/EC FOR HOMOGENEOUS MATERIAL.

TO BE CONTINUED



TEST REPORT NUMBER: SH

TESTS CONDUCTED

(III) TEST METHOD:

(III) TEST WETHOD:		
TESTING ITEM TE	STING METHOD	REPORTING LIMIT
CADMIUM (Cd) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN CLAUSE 8/9/10, BY MICROWAVE DIGESTION UNTIL THE TESTED SAMPLES ARE TOTALLY DISSOLVED AND DETERMINED BY ICP-OES.	2 ppm
LEAD (Pb) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN CLAUSE 8/9/10, BY MICROWAVE DIGESTION UNTIL THE TESTED SAMPLES ARE TOTALLY DISSOLVED AND DETERMINED BY ICP-OES.	2 ppm
MERCURY (Hg) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN CLAUSE 7, BY MICROWAVE DIGESTION UNTIL THE TESTED SAMPLES ARE TOTALLY DISSOLVED AND DETERMINED BY ICP-OES.	2 ppm
CHROMIUM VI (CR ⁶⁺) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN ANNEX C, BY ALKALINE DIGESTION AND DETERMINED BY UV-VIS SPECTROPHOTOMETER.	1 ppm
POLYBROMINATED BIPHENYLS (PBBs)	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN ANNEX A, BY SOLVENT EXTRACTION AND DETERMINED BY GC-MSD AND FURTHER HPLC CONFIRMATION WHEN NECESSARY.	5 ppm
POLYBROMINATED DIPHENYL ETHERS (PBDEs)	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN ANNEX A, BY SOLVENT EXTRACTION AND DETERMINED BY GC-MSD AND FURTHER HPLC CONFIRMATION WHEN NECESSARY.	5 ppm

REMARK: REPORTING LIMIT = QUANTITATION LIMIT OF ANALYZE IN SAMPLE

TO BE CONTINUED

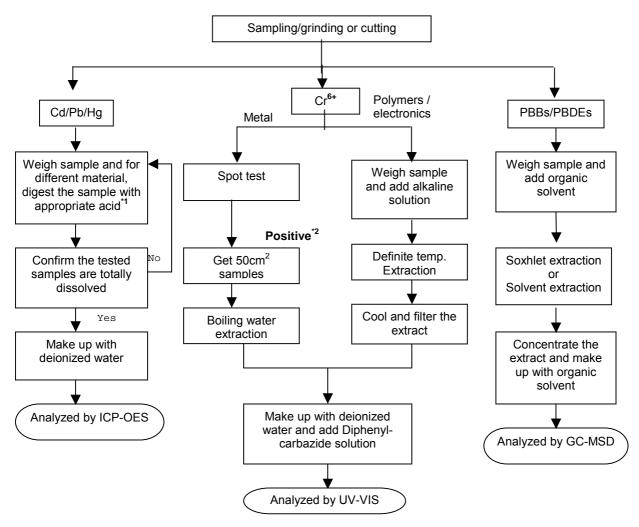
AH00355778



TEST REPORT NUMBER: SH

TESTS CONDUCTED

(IV) MEASUREMENT FLOWCHART: TEST FOR Cd/ Pb/ Hg/Cr (VI)/ PBBS/PBDES CONTENTS REFERENCE STANDARD: IÉC 62321 EDITION 1.0:2008



REMARKS:

*1: LIST OF APPROPRIATE ACID.

1. LIST OF ALT NOT MATE ACID:		
MATERIAL	ACID ADDED FOR DIGESTION	
POLYMERS HNO	_{3,} HCL,HF,H ₂ O _{2,} H ₃ BO ₃	
METALS HNO	_{3,} HCL,HF	
ELECTRONICS HNO	3.HCL,H2O2.HBF4	

*2: IF THE RESULT OF SPOT TEST IS POSITIVE, CHROMIUM (VI) WOULD BE DETERMINED AS DETECTED.

TO BE CONTINUED

AH00355778



TEST REPORT NUMBER: SH AH00355778

TESTS CONDUCTED

2 (I) TEST RESULT SUMMARY:

TESTING ITEM	RESULT (ppm)
HALOGEN CONTENT	
FLUORINE (F)	ND
CHLORINE (CI)	ND
BROMINE (Br)	ND
IODINE (I)	ND

REMARKS: ppm = PARTS PER MILLION = mg/kg

= NOT DETECTED

RESPONSIBILITY OF CHEMIST : GRAVE WANG

(III) TEST METHOD:

TESTING ITEM TE	STING METHOD REPOR	TING LIMIT
HALOGEN CONTENT	WITH REFERENCE TO EN 14582:2007 BY COMBUSTION FLASK WITH OXYGEN AND DETERMINED BY ION CHROMATOGRAPHY	50 ppm

REMARK: REPORTING LIMIT = QUANTITATION LIMIT OF ANALYTE IN SAMPLE

DATE SAMPLE RECEIVED : DEC.5, 2012

TESTING PERIOD: DEC.5, 2012 TO DEC.7, 2012

TO BE CONTINUED

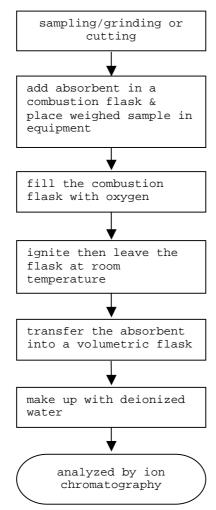


TEST REPORT

TESTS CONDUCTED

(IV) MEASUREMENT FLOWCHART:

TEST FOR HALOGEN CONTENT REFERENCE STANDARD: EN 14582



NUMBER: SH

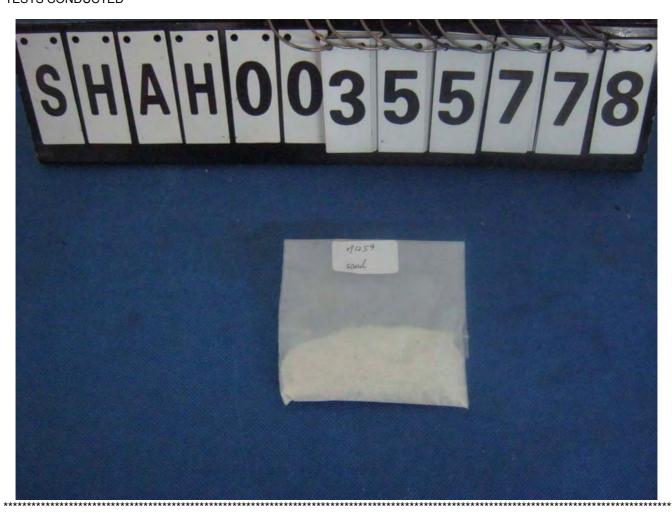
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TO BE CONTINUED



TESTS CONDUCTED

NUMBER: SH AH00355778



END OF REPORT

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Test Report No. SHAEC1317518845 Date: 06 Sep 2013 Page 1 of 6

ZHEJIANG ASIA GENERAL SOLDERING&BRAZING MATERIAL CO., LTD XIHU INDUSTRIAL PARK, SANDUN, HANGZHOU CITY, ZHEJIANG, PROVINCE, CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as: LEAD-FREE SOLDER

WIRE

SGS Job No.: SP13-026309 - SH

Model No.: YTW108 (692535-001 \, 692535-003 \, 693535-004)

Composition : Sn3.0CuRE

Date of Sample Received : 03 Sep 2013

Testing Period: 03 Sep 2013 - 06 Sep 2013

Test Requested : Selected test(s) as requested by client.

Test Method: Please refer to next page(s).

Test Results: Please refer to next page(s).

Conclusion: Based on the performed tests on submitted samples, the results of Lead,

Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE) comply with the limits as set by RoHS

Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of SGS-CSTC Ltd.

JJ Fan

Approved Signatory

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Test Report No. SHAEC1317518845 Date: 06 Sep 2013 Page 2 of 6

Test Results:

Test Part Description:

Specimen No. SGS Sample ID Description

1 SHA13-175188.038 Silvery metal wire

Remarks:

- (1) 1 mg/kg = 1 ppm = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

RoHS Directive 2011/65/EU

Test Method: (1) With reference to IEC 62321-5:2013, determination of Cadmium by ICP-OES.

(2) With reference to IEC 62321-5:2013, determination of Lead by ICP-OES.

(3) With reference to IEC 62321-4:2013, determination of Mercury by ICP-OES.

(4) With reference to IEC 62321:2008, determination of Hexavalent Chromium by spot test / Colorimetric Method using UV-Vis.

(5) With reference to IEC 62321:2008, determination of PBBs and PBDEs by GC-MS.

Test Item(s)	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>038</u>
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	129
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	-	-	\Diamond	Negative
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND

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t E&E (86-21) 61402553 f E&E (86-21) 64953679 HL: (86-21) 61402594 HL: (86-21) 54500353



Test Report	No. SHAEC131751884	45	Date: 06	Sep 2013	Page 3 of 6
Test Item(s)	<u>Limit</u>	<u>Unit</u>	MDL	<u>038</u>	
Dibromodiphenyl ether	-	mg/kg	5	ND	
Tribromodiphenyl ether	-	mg/kg	5	ND	
Tetrabromodiphenyl ether	-	mg/kg	5	ND	
Pentabromodiphenyl ether	-	mg/kg	5	ND	
Hexabromodiphenyl ether	-	mg/kg	5	ND	
Heptabromodiphenyl ether	-	mg/kg	5	ND	
Octabromodiphenyl ether	-	mg/kg	5	ND	
Nonabromodiphenyl ether	-	mg/kg	5	ND	
Decabromodiphenyl ether	-	mg/kg	5	ND	

Notes:

- (1) The maximum permissible limit is quoted from directive 2011/65/EU, Annex II
- (2) \$Spot-test:

Negative = Absence of Cr(VI) coating, Positive = Presence of Cr(VI) coating;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result is Negative or cannot be confirmed.)

◇Boiling-water-extraction:

Negative = Absence of Cr(VI) coating

Positive = Presence of Cr(VI) coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.

Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.

Halogen

Test Method: With reference to EN 14582: 2007, analysis was performed by Ion Chromatograph (IC).

Test Item(s)	<u>Unit</u>	<u>MDL</u>	<u>038</u>
Fluorine (F)	mg/kg	50	ND
Chlorine (CI)	mg/kg	50	392
Bromine (Br)	mg/kg	50	ND
lodine (I)	mg/kg	50	ND

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No. SHAEC1317518845

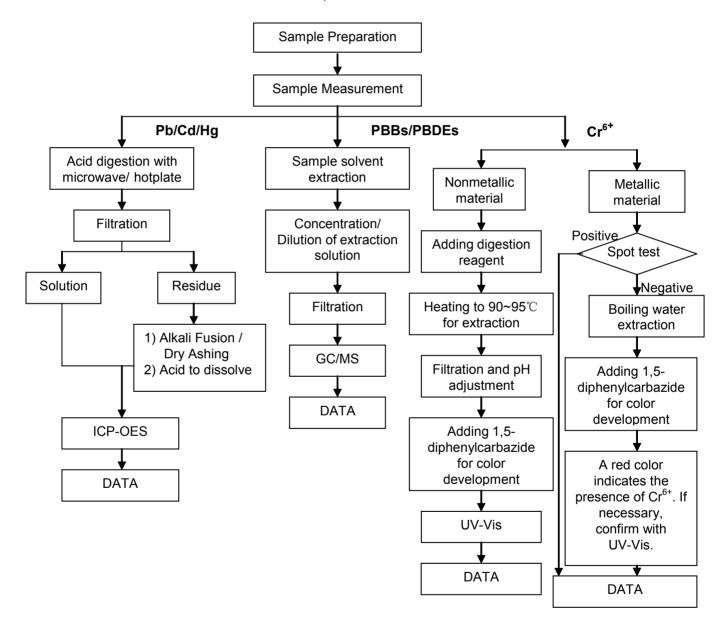
Date: 06 Sep 2013

Page 4 of 6

ATTACHMENTS

RoHS Testing Flow Chart

- 1) Name of the person who made testing: Jan Shi/Star Wang/Shara Wang/Gary Xu
- 2) Name of the person in charge of testing: Jeff Zhang/George Xu/ Jessy Huang
- 3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ and PBBs/PBDEs test method excluded)



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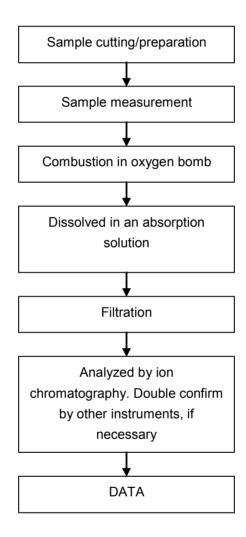
No. SHAEC1317518845

Page 5 of 6

Date: 06 Sep 2013

Halogen Testing (oxygen bomb) Flow Chart

- 1) Name of the person who made testing: Sisily Yin
- 2) Name of the person in charge of testing: Linda Li



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Date: 06 Sep 2013

Page 6 of 6

Sample photo:



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*** End of Report ***

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Report No. RLTJF000103890001

Page 1 of 5

Applicant

BEIJING HYSTIC NEW MATERIALS CO., LTD.

Address

5 SHUANGYUAN ROAD, BADACHU HIGH-TECH ZONE, BEIJING, 100041,

CHINA.

The following sample(s) and sample information was/were submitted and identified by/on the behalf of the client

Sample Name

EPOXY ADHESIVE

Part No.

EP608

Customer Reference

EP625, EP652, EP425, EP162, EP162L, EP209, EP210, EP211, EP229, EP313,

Information

EP315, EP100-EP199, EP200-EP299, EP300-EP399, EP400-EP499,

EP500-EP599, EP600-EP699

Sample Received Date

May. 6, 2013

Testing Period

May. 6, 2013 to May. 8, 2013

Test Requested

As specified by client, to test Lead(Pb), Cadmium(Cd), Mercury(Hg). Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers(PBDEs) in the submitted sample(s).

Test Method

Please refer to the following page(s).

Test Result(s)

Please refer to the following page(s).

Conclusion

Tested Sample	According to directive	Result
Submitted Sample	2011/65/EU*	Pass

^{*2011/65/}EU is a new version of RoHS Directive (2002/95/EC), which focuses on restriction of the use of certain hazardous substances (Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers(PBDEs))in electrical and electronic equipment.

Pass means that the results shown on the report do not exceed the limits set by RoHS Directive 2011/65/EU.

May. 8, 2013

Andy Change

Approved by

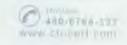
Allen Wang

Date

No. 1428692328

Technical Manager Centre Testing International (Tianjin) Co., Ltd.

No.99, Xianfeng East Road, Dongli District, Tianjin, China





Report No. RLTJF000103890001

Page 2 of 5

Test Method

Test Item(s)	Test Method	Measured Equipment(s)
Lead(Pb)	IEC 62321:2008 Ed.1 Sec.10	ICP-OES
Cadmium(Cd)	IEC 62321:2008 Ed.1 Sec.10	ICP-OES
Mercury(Hg)	IEC 62321:2008 Ed.1 Sec.7	ICP-OES
Hexavalent Chromium(Cr(VI))	IEC 62321:2008 Ed.1 Annex C	UV-Vis
Polybrominated Biphenyls(PBBs)	IEC 62321:2008 Ed.1 Annex A	GC-MS
Polybrominated Diphenyl Ethers(PBDEs)	IEC 62321:2008 Ed.1 Annex A	GC-MS

Test Result(s)

Tested Item(s)	Result	MDL	Limit of Directive 2011/65/EU
Lead(Pb)	N.D.	2 mg/kg	1000 mg/kg
Cadmium(Cd)	N.D.	2 mg/kg	100 mg/kg
Mercury(Hg)	N.D.	2 mg/kg	1000 mg/kg
Hexavalent Chromium(Cr(VI))	N.D.	2 mg/kg	1000 mg/kg

Tested Item(s)	Result	MDL	Limit of Directive 2011/65/EU
Polybrominated Biphenyls(PB	Bs)		
Monobromobiphenyl	N.D.	5 mg/kg	
Dibromobiphenyl	N.D.	5 mg/kg	
Tribromobiphenyl	N.D.	5 mg/kg	
Tetrabromobiphenyl	N.D.	5 mg/kg	
Pentabromobiphenyl	N.D.	5 mg/kg	1000
Hexabromobiphenyl	N.D,	5 mg/kg	1000 mg/kg
Heptabromobiphenyl	N.D.	5 mg/kg	
Octabromobiphenyl	N.D.	5 mg/kg	
Nonabromobiphenyl	N.D.	5 mg/kg	
Decabromobiphenyl	N.D.	5 mg/kg	



Report No. RLTJF000103890001

Page 3 of 5

Tested Item(s)	Result	MDL	Limit of Directive
	1.000	, and	2011/65/EU
Polybrominated Diphenyl Ethers	(PBDEs)		
Monobromodiphenyl ether	N.D.	5 mg/kg	
Dibromodiphenyl ether	N.D.	5 mg/kg	
Tribromodiphenyl ether	N.D.	5 mg/kg	
Tetrabromodiphenyl ether	N.D.	5 mg/kg	
Pentabromodiphenyl ether	N.D.	5 mg/kg	1000 mg/kg
Hexabromodiphenyl ether	N.D.	5 mg/kg	1000 ing/kg
Heptabromodiphenyl ether	N.D,	5 mg/kg	
Octabromodiphenyl ether	N.D.	5 mg/kg	
Nonabromodiphenyl ether	N.D.	5 mg/kg	
Decabromodiphenyl ether	N.D.	5 mg/kg	

Tested Sample/Part Description

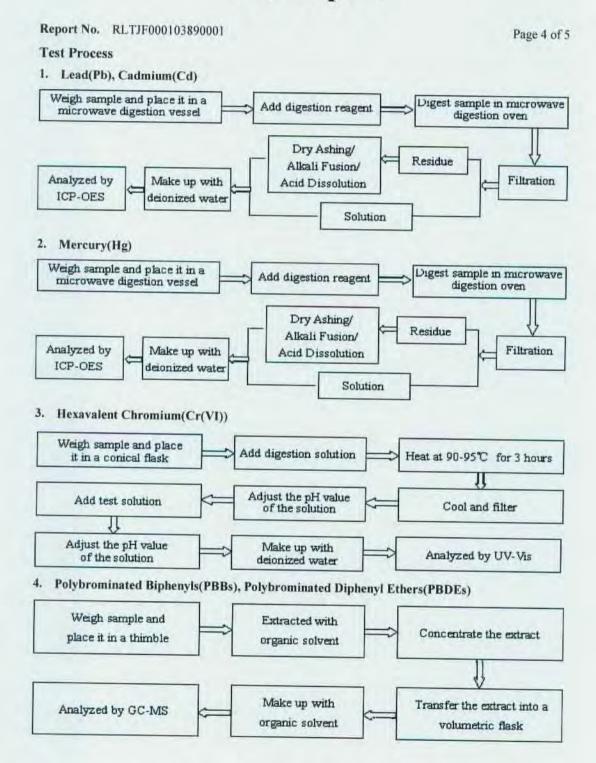
Light yellow liquid

Note:

The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury.

-MDL = Method Detection Limit -N.D. = Not Detected (<MDL) -mg/kg = ppm = parts per million







Report No. RLTJF000103890001

Page 5 of 5

Photo(s) of the sample(s)



*** End of report ***

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Report No. RLTJF000102620001

Page 1 of 3

Applicant

BEIJING HYSTIC NEW MATERIALS CO., LTD.

Address

5 SHUANGYUAN ROAD, BADACHU HIGH-TECH ZONE, BEIJING, 100041,

CHINA.

The following sample(s) and sample information was/were submitted and identified by/on the behalf of the client

Sample Name

EPOXY ADHESIVE

Part No.

EP608

Customer Reference

EP625,EP652,EP425,EP162,EP162L,EP209,EP210,EP211,EP229,EP313.

Information

EP315,EP100-EP199,EP200-EP299,EP300-EP399,EP400-EP499,

EP500-EP599,EP600-EP699

Sample Received Date

Apr. 19, 2013

Testing Period

Apr. 19, 2013 to Apr. 24, 2013

Test Requested

As specified by client, to test Dibutyl phthalate(DBP), Benzyl butyl

phthalate(BBP), Di-2-ethylhexyl phthalate(DEHP), Hexabromocyclododecane

(HBCDD) in the submitted sample(s).

Test Method

Test Item(s)	Test Method	Measured Equipment(s)
Dibutyl phthalate(DBP)	Refer to EN 14372 : 2004	GC-MS
Benzyl butyl phthalate(BBP)	Refer to EN 14372 : 2004	GC-MS
Di-2-ethylhexyl phthalate(DEHP)	Refer to EN 14372 : 2004	GC-MS
Hexabromocyclododecane (HBCDD)	Refer to US EPA 3540C:1996	GC-MS

Test Result(s)

Please refer to the following page(s).

Reviewed by

Apr. 24, 2013

Andy Change

Approved by

Allen Wang

Date

No. 1428612964

Technical Manager Centre Testing International (Tianjin) Co., Ltd.

No.99, Xianfeng East Road, Dongli District, Tianjin, China





Report No. RLTJF000102620001

Page 2 of 3

Test Result(s)

Tested Item(s)	Result	MDL
Hexabromocyclododecane (HBCDD)	N.D.	5 mg/kg
Tested Item(s)	Result	MDL
Phthalate		
Dibutyl phthalate(DBP) CAS#:84-74-2	N.D.	50 mg/kg
Benzyl butyl phthalate(BBP) CAS#:85-68-7	N.D.	50 mg/kg
Di-2-ethylhexyl phthalate(DEHP) CAS#:117-81-7	N.D.	50 mg/kg

Tested Sample/Part Description

Light yellow liquid

Note:

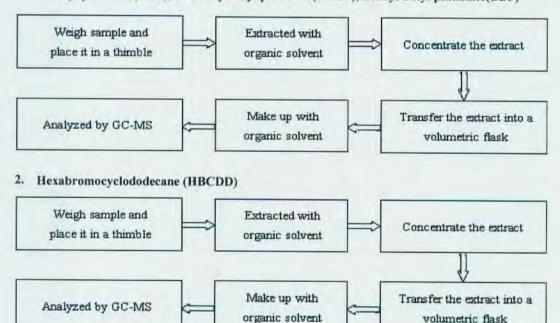
-MDL = Method Detection Limit

-N.D. = Not Detected (<MDL)

-mg/kg = ppm = parts per million

Test Process

1. Dibutyl phthalate(DBP), Di-2-ethylhexyl phthalate(DEHP), Benzyl butyl phthalate(BBP)





Report No. RLTJF000102620001

Page 3 of 3

Photo(s) of the sample(s)



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Report No. RLTJF000102620002

Page 1 of 3

Applicant

BEIJING HYSTIC NEW MATERIALS CO., LTD.

Address

5 SHUANGYUAN ROAD, BADACHU HIGH-TECH ZONE, BEIJING. 100041,

CHINA.

The following sample(s) and sample information was/were submitted and identified by/on the behalf of the client

Sample Name

EPOXY ADHESIVE

Part No.

EP608

Customer Reference

EP625,EP652,EP425,EP162,EP162L,EP209,EP210,EP211,EP229,EP313,

Information

EP315,EP100-EP199,EP200-EP299,EP300-EP399,EP400-EP499,

EP500-EP599,EP600-EP699

Sample Received Date

Apr. 19, 2013

Testing Period

Apr. 19, 2013 to Apr. 24, 2013

Test Requested

As specified by client, to test Fluorine(F), Chlorine(Cl), Bromine(Br), Iodine(I)

in the submitted sample(s).

Test Method

Test Item(s)	Test Method	Measured Equipment(s)	
Fluorine(F)	Refer to BS EN 14582;2007	IC	
Chlorine(Cl)	Refer to BS EN 14582:2007	IC	
Bromine(Br)	Refer to BS EN 14582:2007	IC	
Iodine(I)	Refer to BS EN 14582:2007	IC	

Test Result(s)

Please refer to the following page(s).

Reviewed by Andry Change

Date

Apr. 24, 2013

Allen Wang

Technical Manager

No. 1428612964

Centre Testing International (Tianjin) Co., Ltd.

No.99, Xianfeng East Road, Dongli District, Tianjin, China





Report No. RLTJF000102620002

Page 2 of 3

Test Result(s)

Tested Item(s)	Result	MDL
Halogen(s)		
Fluorine(F)	N.D.	10 mg/kg
Chlorine(Cl)	5.62×10 ³ mg/kg	10 mg/kg
Bromine(Br)	N.D.	10 mg/kg
Iodine(I)	N.D.	10 mg/kg

Tested Sample/Part Description

Light yellow liquid

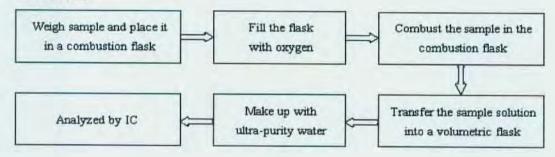
Note:

-MDL = Method Detection Limit

-N.D. = Not Detected (<MDL)

-mg/kg = ppm = parts per million

Test Process





Report No. RLTJF000102620002

Page 3 of 3

Photo(s) of the sample(s)



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Test Report NO.: H09022012704D Date: 2013.09.05 Page 1 of 4

Applicant: SUZHOU SHINWU OPTRONICS TECHNOLOGY CO.,LTD

Address: 368 YOUYI RD, YOUYI DEVELOPMENT AREA, SONGLING TOWN

WUJIANG SUZHOU, CHINA.

The following sample(s) was/were submitted and identified on behalf of the client as:

Sample Name: Sn PLATED Cu

Manufacturer: SUZHOU SHINWU OPTRONICS TECHNOLOGY CO.,LTD

Testing part Description: Mix Tested

Sample Received Date: 2013.09.02

Test Period: 2013.09.02 To 2013.09.05

Reference Requested: RoHS Directive 2011/65/EU Annex II

Reference Method: IEC62321 Edition 1.0 :2008 method: Regulated Substances Content of test

process with Electrical & Electronic Products

(1) Lead Analysis is performed by AAS

(2) Cadmium Analysis is performed by AAS

(3) Mercury Analysis is performed by ICP-OES

(4) Hexavalent Chromium Analysis is performed By Spot-test/Boiling-water-

extraction Method

(5) PBBs and PBDEs Analysis is performed by GC-MS

Test Result: Please refer to next page(s)

Approved by: Zhang Paigin

Code: z71c6

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NO.: H09022012704D

Date: 2013.09.05

Page 2 of 4

Test Result (Unit: mg/kg)

rest Result (Onit: Hig/kg)			
Test Item	MDL	Test Result	RoHS Limit
Lead (Pb)	1 (4)	N.D.	1000
Cadmium (Cd)	1	N.D.	100
Mercury (Hg)	1	N.D.	1000
Hexavalent Chromium (Cr ⁶⁺)	See Note (6)	Negative	
PBBs	A -	A -	1000
Bromobiphenyl	5	N.D.	
Dibromobiphenyl	5	N.D.	
Tribromobiphenyl	5	N.D.	V
Tetrabromobiphenyl	5	N.D.	3 - 3
Pentabromobiphenyl	5	N.D.	_
Hexabromobiphenyl	5	N.D.	_
Heptabromobiphenyl	5	N.D.	_
Octabromobiphenyl	5	N.D.	4-
Nonabromobiphenyl	5	N.D.	()
Decabromobiphenyl	5	N.D.	← −
PBDEs	- (0	<i>y</i> – ((1000
Bromodiphenyl ether	5 (1)	N.D. (4)	_
Dibromodiphenyl ether	5	N.D.	_
Tribromodiphenyl ether	5	N.D.	_
Tetrabromodiphenyl ether	5	N.D.	<u> </u>
Pentabromodiphenyl ether	5	N.D.	4
Hexabromodiphenyl ether	5 4	N.D.	
Heptabromodiphenyl ether	5	N.D.	
Octabromodiphenyl ether	5	N.D.	V - /2
Nonabromodiphenyl ether	5	N.D.	_ <3
Decabromodiphenyl ether	5	N.D.	_
1 3 2	1.7		į.

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NO.: H09022012704D

Date: 2013.09.05

Page 3 of 4

Note:

(1) mg/kg = ppm

- (2) "—" = Does not stipulate
- (3) N.D. = Not Detected (<MDL)
- (4) MDL = Method Detection Limit
- (5) The most allowable limit value reference to RoHS Directive 2011/65/EU Annex II
- (6) Spot-test:

Negative = Not Detected of CrVI coating, Positive = Presence of CrVI coating;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result cannot be confirmed or negative)

Boiling-water-extraction:

Negative = Not Detected of CrVI coating

Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50cm² sample surface area used.

(7) The mixing sample test was performed as client's request. Result obtained only gives informality value and does not represent individual sample material.

Photo:



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NO.: H09022012704D

Date: 2013.09.05

Page 4 of 4

Measurement Flow-chart

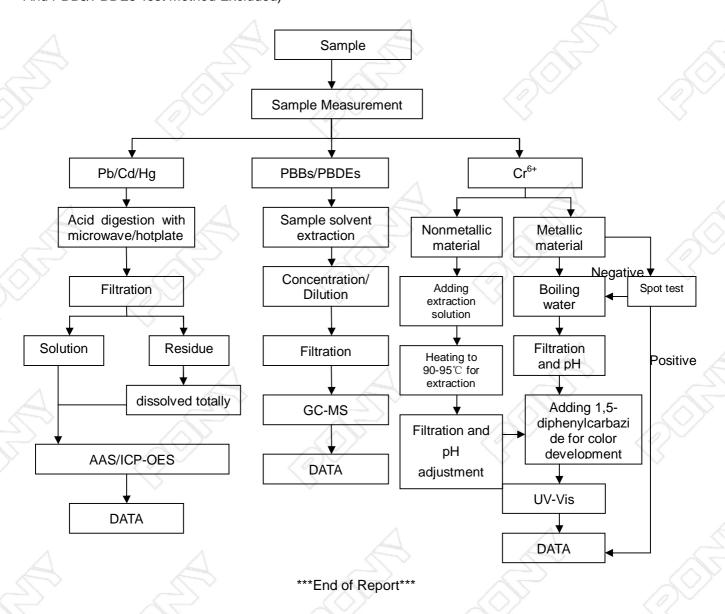
Tested by: Wu Weifei

Checked by: Zhang Yaoqiang

Person in charge of the lab: Zhang Daiqin

These Samples Were Dissolved Totally By Pre-conditioning Method According To Below Flow Chart. (Cr⁶⁺

And PBBs/PBDEs Test Method Excluded)



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Add: YinghuanBinlding Honga Road Nankaidistrict Turnin OHotline 400-819-5688

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XultaDistrict.Shanghai
(021)64851599

GaexinDist, NingboCity (0574)87736499 ChrangveRoid NarshanDistrict/Shen. (0355)26050909 ii. Building) No189HaiZhuTechnopark. DinHeRoid/HaiZhiDistrict/Japagz/si (02089224310 60Floor,No.190,Zijuzhou LaoshanDistrict,Qingdao





Pony Testing International Group

检测报告 报告编号: H01252016704D

日期: 2013.01.30

第1页, 共4页

委托单位:

苏州新吴光电科技有限公司

地址:

苏州吴江区松陵镇友谊开发区友谊路 368 号

委托单位提供样品信息如下:

样品名称:

锌带

买家:

苏州新吴光电科技有限公司

样品接收日期: 2013.01.25

样品检测口期: 2013.01.25 至 2013.01.30

检测要求:

参照 RoHS 2011/65/EU 指令附录Ⅱ要求

检测方法:

依照 IEC62321 Edition 1.0:2008 的方法: 电子电气产品中限用物质含量的测定程序

- (1) 用原子吸收光谱仪测定铅的含量
- (2) 用原子吸收光谱仪测定镉的含量
- (3) 用电感耦合等离子体原子发射光谱仪测定汞的含量
- (4) 用点测试法/沸水萃取法测定六价铬的含量
- (5) 用气相色谱-质谱仪测定多溴联苯和多溴联苯醚的含量

检测结果:

请参见下页

批准人:

本检测单位保证 于检测结果的(则无效;任何x John Man

Code: x3kb2mpj

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www.ponytest.com

& Hotline 400-819-5688

Add: 北京市海淀区苏州街 49-3 号

盈智大厦 Tel: (010) 82618116 Fax: (010) 86219629 上海市徐江区桂平路 680 号 35 号 楼 4 层 (021) 64851999 (021) 64856403

深圳市南山区创业路中兴工业城 6 栋 1 层 (0755) 26050909 (0755) 26068336

PONY 谱 尼 测 证 Pony Testing International Group



Pony Testing International Group

检测报告 报告编号: H01252016704D 日期: 2013.01.30

第2页, 共4页

检测结果 (单位: mg/kg)

检测项目	方法检出限	检测结果	RoHS 限量
铅	1	7	1000
镉	1	24	100
汞	1	未检出	1000
六价铬	参见备注(5)	阴性	
多溴联苯	_		1000
 一溴	5	未检出	
二溴	5	未检出	
三溴	5	未检出	
四溴	5	未检出	
五溴	5	未检出	-
六溴	5	未检出	<u> </u>
七溴	5	未检出	
八溴	5	未检出	
九溴	5	未检出	_
十溴	5	未检出	-
多溴联苯醚	-	_	1000
	5	未检出	
二溴	5	未检出	
三溴	5	未检出	
四溴	5	未检出	
五溴	5	未检出	_
六溴	5	未检出	
七溴	5	未检出	
八溴	5	未检出	
	5	未检出	
十溴	5	未检出	_

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PONY 谱尼测试 Pony Testing International Group

www.ponytest.com & Hotline 400-819-5688 Add: 北京市海淀区苏州街 49-3 号

盈智大厦

Tel: (010) 82618116 Fax: (010) 86219629

上海市徐汇区桂平路 680 号 35 号

楼4层

(021) 64851999 (021) 64856403 深圳市南山区创业路中兴工业城6

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Pony Testing International Group

检测报告 报告编号: H01252016704D

日期: 2013.01.30

第3页,共4页

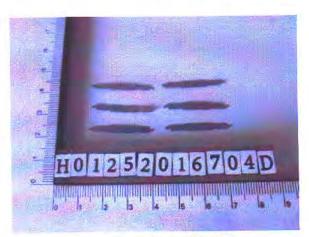
备注: (1) mg/kg = ppm

- (2) "一"= 未规定
- (3) 最大允许极限值引用 RoHS 指令 2011/65/EU 附录 II 的限值要求
- (4) 未检出(<方法检出限)
- (5) 点测试:

阴性=表层中不存在六价铬,阳性=表层中存在六价铬; (如果点测试的检测结果为阴性或不确定,应进一步用沸水萃取法验证) 沸水萃取法:

阴性=表层中不存在六价铬,阳性=表层中存在六价铬; 沸水萃取法中的检测浓度为每 50cm²的测试面积等于或大于 0.02mg/kg

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检测报告 报告编号: H01252016704D

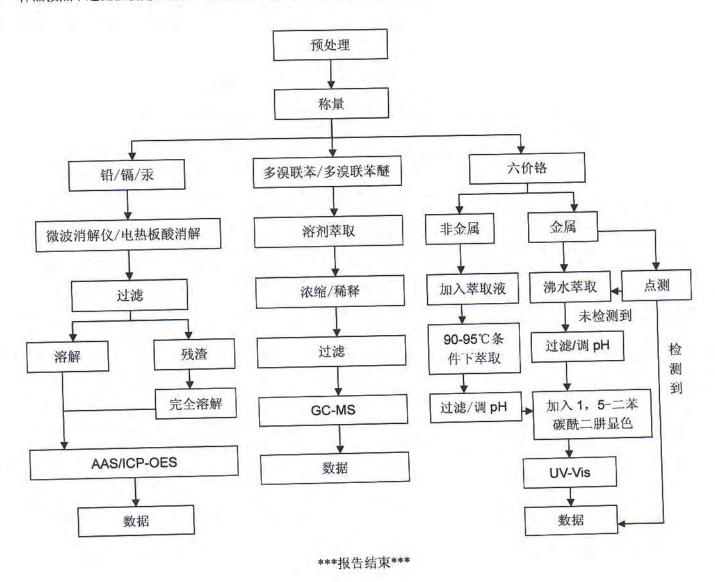
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检测流程图

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样品按照下述流程被完全消解(六价铬和多溴联苯/多溴联苯醚除外)。



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